# Calendar of AMS Meetings and Conferences

This calendar lists all meetings and conferences approved prior to the date this issue went to press. The summer and annual meetings are joint meetings with the Mathematical Association of America. Abstracts of papers presented at a meeting of the Society are published in the journal *Abstracts of papers presented to the American Mathematical Society* in the issue corresponding to that of the Notices which contains the program of the meeting, insofar as is possible. Instructions for submission of abstracts can be found in the January 1993 issue of the Notices on page 46. Abstracts of papers to be presented at the meeting must be received at the headquarters of the Society in Providence, Rhode Island, on or before the deadline given below for the meeting. Note that the deadline for abstracts for consideration for presentation at special sessions is usually three weeks earlier than that specified below.

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* Please refer to page 126 for listing of Special Sessions.
† Please refer to the Table of Contents for further information.

## Conferences


June 11–July 6, 1994: Joint Summer Research Conferences in the Mathematical Sciences, Mt. Holyoke College, South Hadley, Massachusetts.


## Other Events Cosponsored by the Society

May 5–8, 1994: MER Network Workshop, University of Texas at Austin, Austin, Texas.

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* Please contact AMS Advertising Department for an Advertising Rate Card for display advertising deadlines.
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ARTICLES

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The 1994 Böcher Memorial Prize was awarded at the Society's 100th Annual Meeting in Cincinnati, Ohio, to Leon Simon for his profound contributions toward understanding the structure of singular sets for solutions of variational problems.

FEATURE COLUMNS

106 Computers and Mathematics  Keith Devlin
In his third article for the column, George Grätzer continues to look at TeX. This time he concentrates on two integrated TeX implementations, Textures for the Macintosh and PCTeX for Windows for IBM compatibles, and on Scientific Word, a TeX preprocessor. Eric Schweitzer then reports on Xtal, a visual programming language for IBM compatibles running Windows. Finally, Roger Pinkham returns to the column with a review of Data Desk.
From the Executive Director . . .

POLICY COMMITTEES

A year ago, the Council accepted a report recommending a new committee structure in which a small core of policy committees would provide deliberation and long-range advice in the major areas of Society activity: science policy, education, publication, meetings and conferences, and the profession. Two other committees function in much the same way as policy committees and are part of the structure of policy deliberation and long-range planning: the Mathematical Reviews (MR) Editorial Committee and the Committee on Electronic Products and Services.

The Committee on Science Policy has been in place for some time and has proved to be one of the most active and effective committees of the Society. Its work load has so increased in recent years that it recommended forming new committees, one being the Committee on Education, which was formed three years ago. The Committee on Electronic Products and Services was formed two years ago to provide advice about the rapidly changing area of electronic delivery of information. The MR Editorial Committee, which has been in place for quite a long time, provides scientific advice on the content of the MR database. The new policy committees in the areas of publication, meetings and conferences, and the profession were formed this past year.

The five policy committees of the Society are all in place and have met. It is perhaps early to predict, but the structure seems to be working quite well. In order to coordinate the Society’s activities across all these areas and to see that priorities are set and resources are effectively and efficiently used, the AMS Long Range Planning Committee (LRPC) met with the chairs of the policy committees at the Annual Meeting in Cincinnati in January. For this meeting, each policy committee selected a central issue to present and discuss with the LRPC and the other representatives at the meeting.

The Committee on Science Policy (CSP) will establish an effective and acceptable procedure for developing an AMS Federal Policy Agenda, that is, a collection of issues that the AMS believes are most important for the furtherance of mathematical research and scholarship and which need to be advocated at the federal science policy level. The chair of CSP described the committee’s work toward this goal.

The Committee on Education (COE) believes one of the most important issues facing the community is the acceptance of the many roles of a faculty member, roles that evolve over a lifetime and comprise many forms of scholarly activity in research, education, and service. The COE is also concerned with preparation of graduate students, with establishing professional master’s degrees, and with increasing the involvement of mathematicians in the preparation and enhancement of teachers.

The Committee on Publication discussed electronic delivery of information and the transition from “paper to paperless publication”. Mathematical Reviews is very much affected by related matters, such as electronic delivery of MR over the Internet and making the information in the MR database widely accessible to mathematicians. The Committee on Electronic Products and Services is involved in all of these issues and is particularly concerned with making e-MATH more useful to mathematicians. A number of recommendations related to e-MATH were presented and priorities set.

The Committee on Meetings and Conferences reported on its appointment of a task force to review the AMS series of conferences, symposia, and institutes. Among other issues, the task force will consider just how well these activities are serving the mathematician and content at national meetings will be a priority for the Committee on Meetings and Conferences in the coming year.

The Committee on the Profession identified two areas of immediate concern: employment of young mathematicians and the participation of underrepresented groups in mathematics. This committee presented the Council with a resolution on ethical behavior that decried the use of the poor job market for economic exploitation of young mathematicians. The resolution passed unanimously at the Council meeting.

The combined group discussed how the Society might be more efficient in getting ideas into action. It was generally felt that the policy committee structure was helping to make the Society a more progressive and responsive organization. Plans have been made to set up forums on e-MATH and at meetings where the issues before these committees can be discussed with the membership of the Society. The policy committees seem to be off to a great start.

William Jaco
Leon Simon Receives
1994 Bôcher Memorial Prize

The Bôcher Memorial Prize is awarded every five years for a notable research memoir in analysis which has appeared in the previous five years. The prize honors the memory of Maxime Bôcher (1867–1918), who was the Society’s second Colloquium Lecturer (1896) and tenth president (1909–1910) and one of the founding editors of Transactions of the AMS. The recipient must be a member of the Society, or the memoir for which the award is given must be published in a recognized North American journal. The prize carries a cash award of $4000.

The seventeenth award was made at the Society’s 100th Annual Meeting in Cincinnati, Ohio, on January 13, 1994. The 1994 recipient is Leon Simon of Stanford University.

The prize was awarded by the AMS Council acting on the recommendation of the Committee to Select the 1994 Recipient of the Bôcher Prize. The committee members are Luis A. Caffarelli, Richard B. Melrose, and Richard M. Schoen (chair).

The text below includes the committee’s citation, Simon’s response on presentation of the award, and a brief biographical sketch.

Citation
The 1994 Bôcher Prize is awarded to Leon Simon for his profound contributions toward understanding the structure of singular sets for solutions of variational problems.

Powerful methods were developed in the 1960s to establish the partial regularity of minima and critical points of the Plateau problem and later extended to other variational problems such as the harmonic mapping problem. These results left open basic questions about the structure of the set of singularities exhibited by the solutions of such variational problems.

In a series of papers over the past ten years, Simon has developed methods for analyzing this structure. This development began with his 1983 paper on asymptotics near isolated singularities, entitled “Asymptotics for a class of nonlinear evolution equations, with applications to geometric problems”, Annals of Mathematics 118 (1983), pp. 525–572. The first stage of his work on general singular sets is principally described in “Cylindrical tangent cones and the singular set of minimal submanifolds”, Journal of Differential Geometry 38 (1993), pp. 585–652, and the remaining work appears in his paper “Rectifiability of the singular set of energy minimizing maps” (Preprint, Stanford University, 1993). This latter paper establishes rectifiability for the singular sets of energy minimizing maps into an arbitrary compact real analytic target manifold.

Response
I am very honored to be awarded the 1994 Bôcher Prize.

In this response I would first like to offer thanks to the Bôcher Prize Committee for their kind recognition of my work, and also to the various people to whom I am most indebted, both personally and professionally: To my family, and especially to my wife Sandra; to Jim Michael
for his guidance and mathematical insight during the period of my undergraduate and graduate work at the University of Adelaide; and to David Gilbarg for his constant support and for the numerous mathematical conversations we enjoyed during my time as an assistant professor at Stanford University and later. There are also many colleagues, both present and past, to thank. Of these I want to mention especially Shing-Tung Yau, Richard Schoen, and Robert Hardt.

As the citation mentions, much of my recent work addresses questions about the structure of the singular sets of the solutions of various geometric variational problems. These questions arose naturally from the work of the pioneers in the field of geometric measure theory/geometric calculus of variations, including De Giorgi, Reifenberg, Federer, Fleming, Almgren, and Allard, who are principally responsible for the initial development of the partial regularity and existence theory for minimal surfaces. An analogous partial regularity theory for energy minimizing maps between Riemannian manifolds was later established by Schoen and Uhlenbeck. The latter work, for example, established that if the domain of a bounded energy minimizing map has dimension \( n \), then the dimension of the singular set (i.e., the set of points where the map fails to be locally smooth) is \( n - 3 \); the dimension referred to here is Hausdorff dimension, so the result is that the singular set has Hausdorff measure zero in any dimension larger than \( n - 3 \). Part of my work cited above shows that if the target manifold is real-analytic, then the singular set locally decomposes into finitely many locally \((n-3)\)-rectifiable, locally compact pieces. (Here “locally” means in a neighborhood of each point of the relevant set.) There are analogous results for various classes of minimal surfaces, always in the appropriate dimension. For example, for \( n \)-dimensional mod 2 area minimizing surfaces, the singular set is shown to locally decompose into finitely many locally \((n-2)\)-rectifiable, locally compact pieces. In some special cases it is possible to prove more, including even that the singular set is a union of smooth manifolds together with a compact set of lower dimension.

The methods used in the proof of these results are a mixture of geometric measure theory and PDE methods. The PDE methods involve in part ideas originating in quasilinear elliptic theory, developed by C. B. Morrey, E. De Giorgi, O. Ladyzhenskaya, N. Uraltseva, J. Moser, and others, principally during the period from the late 1930s to the mid-1970s.

There are still many fascinating and fundamental questions remaining in the analytic side of the geometric calculus of variations, and these questions have an added dimension of interest by virtue of their close connection to important problems in geometry. For example, in recent times there has been much interest in geometric evolution problems, beginning with the work of Hamilton, Brakke, and Huisken on Ricci and mean-curvature flow; and here there are important unsolved problems related to singularities, including how singularities form and the structure of the actual set of singularities in space-time.

Certainly it seems clear that both measure-theoretic and hard analysis methods have an important role to play in the field for the foreseeable future.

Biographical Sketch

Leon Simon received his Ph.D. from the University of Adelaide, South Australia, in 1971. He held positions as assistant professor at Stanford University (1973–1975), associate professor at the University of Minnesota (1976–1977), and professor of mathematics at the University of Melbourne (1978–1980) and The Australian National University (1981–1986). Since 1986 he has been professor of mathematics at Stanford University.

Professor Simon was a Sloan Fellow (1974–1975), was elected Fellow of the Australian Academy of Sciences (1983), and received an Australian Mathematical Society Medal (1983).

He has held visiting positions in various institutions, including the Mittag-Leffler Institute (Sweden), Courant Institute of Mathematical Sciences (New York), University of Adelaide (South Australia), Institute for Advanced Study (Princeton), and Eidgenössische Technische Hochschule (Zürich).

His major research interests are geometric measure theory and partial differential equations.
The Forum section publishes short articles on issues that are of interest to the mathematical community. Articles should be between 1000 and 2500 words long. Readers are invited to submit articles for possible inclusion in Forum to:

Notices Forum Editor
American Mathematical Society
P.O. Box 6248
Providence, RI 02940
or electronically to notices@math.ams.org

Some Thoughts on the Funding of Mathematics
William Yslas Vélez
The University of Arizona

I have just finished a one-year stint as program officer for the Algebra and Number Theory program in the Division of Mathematical Sciences at the National Science Foundation. It was certainly an interesting year, one which I would definitely repeat. I cannot say that it was enjoyable (the workload was tremendous), but I can say that it was challenging. Based on this experience I would like to bring to the mathematics community three issues:

1. Why and how should this country fund mathematical research?
2. In determining which graduate students receive funding as part of an NSF grant, should U.S. citizens and permanent residents be given preference?
3. What are the responsibilities of an academic department to the citizens of this country?

The Funding of Mathematical Research

I arrived at the NSF in August 1992, just as the division was in the midst of deliberations on the issue of “flat-rate” funding. You will recall that the flat-rate scheme was to consist of essentially two funding levels, one at around twenty thousand and the other at around thirty thousand. This scheme was rejected by “the mathematical community”. The reason for the quotation marks is that I am not 100 percent sure who exactly turned it down. My impressions were that the majority of the community was behind this idea. In any case, the end result of this situation was that the program officers were left with little advice as to how to fund mathematical research. (The reader might consult the article which appeared in the July/August 1993 issue of the Notices of the AMS for remarks by Fred Wan on this issue.) In fact, after my experience in this position, I personally have to admit that I am not sure how best to fund mathematical research. I know what tradition tells me, that I should provide 2/9 summer salary, graduate student support, and $2000–$3000 for other activities, plus some computing expenses, if they are warranted. The problem that keeps coming up is this question of summer salary. Should summer salary be provided, and how much should be provided?

This last year I processed around 130 proposals and recommended around forty proposals for funding. When I think back to the proposals that went unfunded, I remember many proposals that represented the efforts of hard-working and talented individuals. However, the cutoff level for funding is so high these days that these talented individuals were not funded. But these unfunded mathematicians have not stopped working, and they are carrying out very active and important research programs. How should the NSF fund mathematics?

Several issues need to be addressed. Should the NSF fund a small elite group of mathematicians, or should the NSF attempt to find a greater variety of mathematical scientists? How should these mathematicians be funded? How does society benefit from funding mathematical research?

Suppose that a researcher does not get funded. What is such a person to do? One choice is simply not to do research during the summer and to go work in the garden. If the researcher is a junior faculty member, this is not a strategy that will bring tenure. One common choice is to teach summer school where possible. So, the unfunded person will teach 5–8 weeks during the summer and do research the rest of the time. The unfunded and funded researchers both work hard all year, except that one of them has to teach for 5–8 weeks. In practice, what an NSF grant buys is 5–8 weeks of summer work at a cost of $20,000–$40,000!

If teaching is not an option for the researcher, but summer salary is still a necessity, then another possibility is to hustle some consulting work in either business or the
defense industry. In this option, the researcher probably does not produce publishable mathematical work, and research in mathematics is slowed down. Do society and the profession suffer from this scenario? No, quite the contrary! If more working mathematicians addressed the issues that arose in business or the defense industry, then these industries would see how powerful mathematicians are and that would open new job opportunities for our students.

Now that we understand what funding buys, we turn to the question of who gets funded. It appears that in determining who it is that receives a research grant, creativity seems to be the primary difference between those who are funded and those who are not. It appears that the most creative researchers are the ones that need the most funding. Why is that? Granted, it is these individuals who make the most spectacular breakthroughs, but why do they need this funding in order to carry out the research program? This is an important issue. The budgets that are attached to the proposals are almost completely divorced from the proposal itself, and, except for tradition, there is no rationale for requesting the summer salary. However, here are some of the reasons that I have heard while at the foundation.

POVERTY: “My university does not pay me enough, and, if I do not have these funds, I would have to teach or find some other way of making money.” My thoughts: This vaguely reminds me of a welfare system for university faculty.

CHILDREN: “My children are now attending private schools, and I sure need the money.” My thoughts: So the children of the most creative researchers need to have their education subsidized by the taxpayers.

PRIDE: “I don’t mind getting partial summer funding if everyone else is. But if anyone is getting full funding, I certainly should get it because I am the best mathematician working in this area.” My thoughts: How many times did I hear that one!

TENURE: “This award will help me to get tenure.” My thoughts: NSF program officers should not play such an important role here.

FELLOWSHIP: “Based on my reputation and my past work, I deserve an award. I can’t be bothered with providing you with documentation to support these claims.” My thoughts: Are NSF awards either fellowships or research grants? I have seen several 2–4-page proposals that stated essentially this. The proposer felt that he was leading the pack and the NSF should simply hand over the money.

I may have been a bit frivolous, but the issue of who to fund and the correct way to fund mathematical research is a very serious one, and it is one that the mathematical community should confront before someone else sets the agenda for us.

The Funding of Graduate Students on NSF Research Grants
An issue that I chose to address while I was at the NSF was the question of foreign graduate students. Fifteen or twenty years ago, foreign graduate students made up a small percentage of the graduate students in the sciences. Recently, we have seen this figure rise, and it appears that now the majority of doctoral mathematics degrees are being awarded to foreign students. One of the factors that has caused this increase in the foreign-student population is the lack of interest among U.S. citizens to study higher-level mathematics. Even though fewer of these students chose to study graduate-level mathematics, this did not mean that graduate production decreased dramatically. Departments had slots to fill, and it was unthinkable that these slots would go unfilled, so foreign students began arriving. Perhaps it would have been better to have slowed down Ph.D. production. The profession would be healthier for it, and the mathematical community should consider this option seriously, even now.

The issue that concerned me in dealing with foreign students was the funding of their studies in this country. Were the percentage of foreign graduate students in the teens, there would be no need to be concerned about this. However, now that this figure is around 50 percent, it needs to be addressed. In particular I was confronted by this problem as I looked at grant proposals that arrived to my program. I had to determine whether or not to support the graduate students that the investigator requested. My thought on this issue was as follows. The program that I managed supported the best mathematicians around. A student who has the opportunity to work under one of these individuals already has an advantage in the academic world. This advantage is further amplified when that student is given a research fellowship or is supported by someone’s grant. The opportunity for uninterrupted study is critical to a student and allows the student to write an even better thesis.

A student that is supported under an NSF grant is being given preferential treatment. As such, it appears to me that the children of those taxpayers who are supporting this research should be given preferential treatment. Further, when considering which students get funding under NSF grants, priority should be given to students who are U.S. citizens or permanent residents.

STOP! We’ve all heard it before. Many of the readers are already thinking that the result of such a priority will be a decrease in the quality of the graduate students. I would like to make two points regarding this concern. First of all, if academia expects to see a decrease in the quality of the graduate students, they can certainly ensure that outcome. I am sure that everyone told Jaime Escalante at Garfield High School that he couldn’t possibly hope to teach calculus to a bunch of poor Hispanics from East Los Angeles. But someone, or some community, with a vision can bring about the unexpected. The second point that I want to make concerns the international marketplace. Suppose that we opened up every position in this country to anyone in the world. Would we expect that an American would get the position, based only on qualifications? I think not; yet that is exactly how we treat the graduate students. Maybe we ought to apply the same criteria to research grants. Instead of just funding investigators in this country, maybe the NSF should support simply the best science. Then how many of the investigators in this country
would be funded? But we don’t do that because the “N” in NSF means national, and the funds for research are supposed to have a positive impact on science and science education in this country.

Earlier I alluded to the question as to what it is that society gets out of funding mathematics. The standard answer is that support of pure research pays off in the long run, and society and the Congress sort of believe this and provide funds for this research. What is hardly ever mentioned is the short-term benefit of this funding, and that is that our children will have the opportunity to learn from brilliant researchers and, with this education, these same children will be able to participate in these exciting careers. I think that parents live with this hope and support education because of this. However, our graduate programs are no longer aimed at our children. This is a dangerous state of affairs, and if the public and the Congress became truly aware of this situation, we might find it hard to convince them to continue their support of our research endeavors.

It is a common complaint that American students do not want to study mathematics, and it is difficult to attract them to the study of mathematics. There is no question that efforts aimed at attracting this recalcitrant population would take away from research time. Given a choice between research and encouraging students to continue in their mathematical studies, which choice should the mathematics community make? The choice that is made is influenced by a pervasive attitude among mathematicians that there are very few students with the potential to be great research mathematicians. To some extent this is true. There are very few Hilberts around. There are very few individuals who are capable of writing that wondrous music that makes the rest of the mathematical community sing. Many of us have been captivated by the song, and we have spent most of our lives trying to understand it, rewriting the score, improvising on the main themes, all the while enjoying ourselves. What is oftentimes forgotten is that the individuals who write the best scores are many times either not capable or not interested in signing the songs. Is it any wonder that our youth have not been captivated by the song? In order to interest our youth in the study of mathematics, we need more diversity in the presentation. It doesn’t take a Hilbert to make mathematics interesting.

I am not gloomy about the prospects of encouraging our youth to study more mathematics. It does take energy, and it does take up some of the resources of a department. However, it should be a part of the social contract that we have with the community. It is in the best interest of our country, and our mathematics community, to produce a mathematically literate work force. Some of these students grow up to become policy makers. The NSF has a responsibility to encourage American students to pursue careers in mathematics. It is in keeping with this responsibility that priority should be given to funding American graduate students on research grants. I encourage you to write and express your views to those who are making the decisions on these issues. I suggest that you write to the officials at the National Science Foundation, to your congress person, and in particular to Mr. George Brown, Representative from California and chairperson of the Committee on Science, Space, and Technology.

We, as a community of scholars, benefit from the support of the country, and the children of this country should be given a chance to participate in these adventures.

The Coming Disaster in Science Education in America

John Saxon

(Editor’s Note: John Saxon is the president of Saxon Publishers in Norman, Oklahoma. He is the author of a mathematics series that has been used in over 4,000 American schools.)

I believe that the present disaster in science education in America will be drastically exacerbated in the next decade because of recent actions of the National Council of Teachers of Mathematics (NCTM). These actions are capricious at best and approach total irresponsibility at worst. This organization has decided, with no advanced testing whatsoever, to replace preparation for calculus, physics, chemistry, and engineering with a watered-down mathematics curriculum that will emphasize the teaching of probability and statistics and will encourage the replacement of the development of paper-and-pencil skills with drills on calculators and computers. This drastic shift in emphasis will leave American students bereft of the detailed knowledge of the parts that permit the whole to be comprehended.

America is on the road to becoming a follower in technology and science rather than a leader. Our captains of industry tell us that they are at a disadvantage in worldwide competition because our labor pool is mathematically incompetent. This incompetence has been documented by recent tests which show that 82 percent of our 17-year-olds do not know what the word area means and also by international test results wherein American students scored near the bottom of the students in the nations tested. The engineering and physics departments of American universities have an overabundance of foreign-born students and teachers because most American university students do not know the mathematics necessary to be successful in engineering and physics.

To correct this situation, we need a no-frills national mathematics program that concentrates on precalculus fundamentals. We have to get our best students (30 percent) through advanced placement calculus in high school and get the next ability group (40 percent) prepared for calculus as college freshmen. The rest of the students should master the fundamentals of mathematics that are required to be productive members of our labor pool, enabling us to compete with Europe and the Asian nations. It can be done. Jaime Escalante, whose exploits were documented in the film Stand and Deliver, had 150 students in advanced placement calculus at Garfield High School in 1988–1989. This school is in the heavily Hispanic East Los Angeles area. If all of our schools had the same percentage of students in calculus, there would be no crisis in American scientific education.

Rather than implement a program to prepare students for engineering and the hard sciences, as well as for advanced
mathematics, the mathematics education “experts” of the NCTM have come up with a document called “Standards for School Mathematics”. This document makes absolutely no mention of preparing students for chemistry. It makes no mention of preparing students for physics or engineering. The document even denigrates the idea of preparing students for calculus. The document discusses the mathematics needed for “business, economics, linguistics, biology, medicine, and sociology” and says, “However, the fundamental mathematical ideas needed in these areas are not necessarily those studied in the traditional algebra-geometry-precalculus-calculus sequence, a sequence designed with engineering and physical science applications in mind.”

Our country is at risk, and the NCTM is now insisting on a radical, totally untested shift in the mathematics curriculum that veers away from preparing students for calculus and the hard sciences. The Standards detail how this watering-down process is to be carried out. Students will devote less attention to memorizing subtraction facts and will have less paper-and-pencil practice with fractions and less paper-and-pencil practice with long division. Books will deemphasize the teaching of radical expressions, conic sections, paper-and-pencil solutions of trigonometric equations, and the solutions of the old-fashioned fundamental word problems that have been used historically to teach the concepts and skills necessary to solve all problems.

The scenario is almost an exact duplicate of the scenario of the “new math” disaster which was caused by the enthusiastic and hasty implementation of another totally untested set of recommendations made by another committee of “experts”. The first scenario was in the 1960s, and the committee was called the School Mathematics Study Group and was chaired by Professor Begle of Yale University. This group was studying ways of improving secondary mathematics education in America when the Russians first launched Sputnik. A national panic ensued because obviously “America was falling behind the Russians in math and science”. The recommendations of this committee were used as the basis of a paperback series called SMSG, or the “new math”. The radical, untested shift in emphasis contained therein was forced into every American classroom because anyone who objected to this nonsense was branded as being unpatriotic.

In the late 1970s it became apparent to some of the insiders that all was not well in math education. Calculators and computers for classroom use had been recommended since 1972. Neither of these instruments had been shown to be effective at that time, but a drowning man will grasp at any straw. The NCTM felt that leadership was necessary, so they threw together a document called “The Agenda for the Eighties”, in which it was recommended again that calculators and computers be used in classrooms and that the emphasis in math classes be shifted to problem solving of “real world” problems.

The efficacy of the use of calculators in elementary schools still had not been proved, and many people questioned the wisdom of introducing calculators before students had become proficient with paper-and-pencil exercises. In 1984 a meta-analysis of all the tests on the use of calculators in elementary schools was completed. One of the tests in this analysis showed that calculators were significantly damaging to the calculating ability of average fourth-graders. This one significant negative finding would cause a prudent man to proceed with caution. But the NCTM ignored this finding and recommended that calculators be made available in every elementary grade and that “students be allowed to decide when it was better to estimate, to use paper and pencil, or to use a calculator.” They even used the meta-analysis to justify this recommendation and said that the findings for the use of calculators outweighed the findings against the use of calculators. So they again heavily recommended calculators for use in elementary schools. Can you imagine what would happen to the Federal Drug Administration if it approved a drug that was damaging only to average ten-year-olds?

I dwell on the calculator issue, not because it is so important, but to emphasize the mentality of the committees of experts who have been and are directing mathematics education in America. Jack Nicklaus is an expert golfer because he has won more major golf tournaments than any other man. Boris Becker and Steffi Graf are members of the pantheon of kings and queens of tennis because of their successes. Only in American mathematics education do people with a track record of abject failure arrogate the title of “expert”. We have implemented their recommendations for years and years without requiring proof of efficacy first. I say that the time has come to question the experts, especially since they have asked the country to join them in another untested and questionable shift in pedagogy that I believe will cause great harm to America and should be called the “new new math”.

The major thrust of this program will be an attempt to teach students the art of solving “real world problems” without first teaching the concepts and skills. The idea is to let skill development and concept understanding evolve from the use of the concepts and skills in the solutions of real world problems. The initial concept understanding is supposed to result from the explanation of the teacher (which seldom occurs), and then the emphasis is to be on applications of the concept. Of course, the “experts” believe that there is no need to prove that this approach is feasible before it is forced on the students of America. They have talked almost every responsible organization in American education into endorsing the Standards. They list the endorsement of forty organizations, including the National Association of Secondary School Principals, the National Society of Professional Engineers, and the American Association of Physics Teachers. Even the astronaut Sally Ride has endorsed the Standards. Who could be against standards for American mathematics education? I assume that these people endorsed the program without fully realizing what they were endorsing. Certainly everyone is in favor of doing something about the sad state of math and science education in America, and, as do our “experts”, they grasp at any straw.

I began visiting Jaime Escalante soon after his success in teaching calculus in Garfield High School in East Los
Forum

Angeles was reported by Reader's Digest. Mr. Escalante sees high school calculus as a lever that Hispanic children can use to enable them to get college scholarships in engineering and thus to become full participants in our technological society. Mr. Escalante is certainly in favor of standards for his students. How does it happen that he was quoted in the press as saying that “whoever wrote [the Standards] must be a physical education teacher”? It is because the NCTM Standards comprises another flight of fancy by putative experts. These “experts” recoil in anger when asked why they should not prove the expected results of their recommendations before they are implemented. Jaime Escalante has proved his methods before the entire world. Why should the NCTM not do the same? I was happy to see Mr. Escalante’s comment. I had read the Standards carefully and was convinced that they had been compiled behind the looking glass with Alice at the Mad Hatter’s tea party. The document is replete with nonsense such as the following:

Our premise is that what a student learns depends to a great degree on how he or she has learned it. For example, one could expect to see students recording measurements of real objects, collecting information and describing their properties using statistics, and exploring the properties of a function by examining its graph. This vision sees students studying much of the same mathematics currently taught but with quite a different emphasis; it also sees some mathematics being taught that in the past has received little emphasis in schools.

This premise and vision gibberish is followed by statements that students should learn to value mathematics, become confident, become mathematical problem solvers, learn to communicate mathematically, and learn to reason mathematically. If one reads the entire Standards document carefully, it is really difficult to decide whether it was written behind the looking glass by the Red Queen or if it was written by a physical education instructor, as Jaime Escalante contends.

We need to get as many students as we can through calculus in high school. We need students who are competent in the use of fractions, decimals, mixed numbers, percent, and ratios. We need students who know trigonometry and analytic geometry. We need a work force that allows Americans to compete successfully in a technological world. We do not need guidelines that recommend leaving students ill-prepared for chemistry and physics and that ridicule preparation for calculus.

This violent shift in emphasis recommended by the NCTM stems from the failure of the experts to find a way to teach the concepts and skills first. The first draft of the Standards stated that because we have been unable to teach the concepts and skills first and then teach the applications, we must have been trying to do it the wrong way. Thus we should try to do it the other way. We should try to teach the concepts and skills through the study of real word problems. The fallacy of this reasoning is self-evident.

I was aghast at this wild surmise and was chagrined that one of the authors of the Standards deleted this statement before the final version was printed. This statement was a dead giveaway to the pie-in-the-sky fuzzy thinking that lay behind the whole document. America has depended on our “experts” in mathematics education for thirty years and they have let us down. Now they propose that we accept a set of nebulous recommendations that are totally unproven. The book companies will work feverishly to publish books that try to meet the guidelines, and the result will be an acceleration of the disaster in mathematics and science education. It will take at least ten years for the full extent of this coming disaster to become apparent. College math enrollment will decline, and the number of American students in physics and engineering will decline even further. And no one will be to blame. They will all say, “It wasn’t my fault.” I guess that is the advantage of being just a member of a “committee of experts.”
Computers and Mathematics

Edited by Keith Devlin

This month's column

In his third article for the column, George Gratzer continues to look at \TeX. This time he concentrates on two integrated \TeX implementations, 
Textures for the Macintosh and PCTex for Windows for IBM compatibles, and on Scientific Word, a \TeX preprocessor.

Eric Schweitzer then reports on Xtal, a visual programming language for IBM compatibles running Windows.

Finally, Roger Pinkham returns to the column with a review of Datadesk.

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Advances in \TeX implementations.

II. Integrated Environments

George Grätzer*

1. Introduction

I started with Textures on a Macintosh. When I started writing [3], I felt that it was important for me to become exposed to the way \TeX is done on IBM compatible computers. Textures is, of course, an integrated \TeX implementation. Not wanting to give up the comfort I had gotten used to, I asked, “Are there Windows implementations of \TeX?”

Many responded in a somewhat puzzled manner: “\TeX as a DOS program under Windows.” This surprised me. I have always done \TeX in an integrated environment; why doesn’t everybody do the same? I also had difficulty following the advice. Most \TeXs were either “small” (restricted capacity) or used memory extension programs that were incompatible with Windows.

What a change a few years brought! Under Windows, programs can concentrate on doing their jobs well; printing and displaying are left to Windows. Gone are the days when with every program we had to learn anew how to open a file and save it—under Windows such tasks are standardized.

In this article I will review two integrated \TeX implementations. Textures, the classical implementation on the Macintosh (in its modern variant, Lightning Textures), and the brand new PCTex for Windows for IBM compatible computers. I shall also review Scientific Word, a \TeX preprocessor.

2. Lightning Textures

I am hardly an impartial user of Lightning Textures. I started with the product when it was simply Textures, and a lot has changed since.

It is also difficult for me to write impartial comparisons with competing products for IBM compatible computers because I have much better hardware with my Macintosh. Although the CPUs are comparable (68040 and 80486), the displays are not. On the Macintosh I have a two-page monitor, while on my IBM compatible computer I have a 17-inch color monitor. Of course, the large real estate is ideal for integrated \TeX environments.

However, there is little debate in the mathematical community that Lightning Textures is a first-class product. It is powerful, and it is still easy and convenient to use.

The program starts up with the six menus (File, Edit, Macros, Typeset, View, and Windows). If you start the program by clicking on a previously typeset \TeX file, then the program starts with the text file open where the editing was left off, and the typeset window open to the first page of the typeset document (off center; the program forgets which typeset page you were on and how it was placed—a real nuisance).

The \TeX source document has its own window, and so does the typeset version. You can also have the \TeX log window open to see the messages \TeX sends. In case of an
error the TeX log dialog box comes up, and if you click Quit, the cursor is placed on the offending line—correcting an error could hardly be made any easier. If you are located somewhere in the typeset version, new typesetting does not change your location; it only reprints the typeset page with the new version.

When you \dump a new format, you name it, and the name gets added to the Typeset menu. The format chosen for a document is remembered, so typesetting is automatically done with the correct format.

The evolution of Textures to Lightning Textures featured two major improvements. The more important of the two was rewriting and optimizing \TeX in assembly language. The result was dramatic. The company claims a threefold increase in speed; my own experience is even better.

The second improvement is more spectacular but maybe not quite so important: it added Flash mode to the Typeset menu. If this item is checked, the manuscript is automatically typeset twice, cross references will be incorrect following a change your location; it only reprints the typeset page with the new version.

The integrated editor is an indispensible part of Lightning Textures; unfortunately, it is also its weakest point. Many users create in this editor a "skeleton" file with \input that points to another file edited by, say, Nisus or some other capable application. Even the most basic editing features such as Paste, Undo, and Wrap are implemented in a way that would strike Mac (and Windows) users as unusual. For instance, writing a paragraph, pasting in a few words, changing your mind, and executing Undo may make the whole paragraph disappear. Version 1.6 of Lightning Textures introduced some welcome improvements in the editor, including the customizable Macros menu and easy-to-use marking of places in the document for faster navigation. One can only hope for more improvements.

In Version 1.6 there are many improvements in EdMetrics, the font metrics editor for Textures, as well as support for virtual fonts. You better be an expert user if you want to make use of these tools. The forthcoming new user's guide will be welcome.

3. \texttt{PCTeX} for \texttt{Windows}

It is not easy for a DOS programmer to switch to \texttt{Windows} programming. When I started receiving early in-progress versions of \texttt{PCTeX} for \texttt{Windows}, I was doubtful that Personal \TeX's DOS programmers would make the switch successfully. I was proven wrong. \texttt{PCTeX} for \texttt{Windows} is an excellent integrated \TeX implementation; and the manual matches the program.

The ease of use starts with the installation. Installation instructions for \texttt{PCTeX} were voluminous and complicated. For \texttt{PCTeX} for \texttt{Windows} you do not really need any instructions; you do what you always do under \texttt{Windows}: in the Program Manager, choose Run in the File menu to start setup on the floppy disk and follow the easy instructions on the screen. This will install everything you need.

To start the program double click on the \texttt{PCTeX} icon that the installation creates on the desktop. The program opens in a window adorned with four menus: the standard File, Typeset, and Help, and the interesting Settings. Underneath there is a toolbar with 16 icons, so that most of the commands that are available on the menus are just one click away.

Two menu items deserve special mention. Settings lets you customize the program in many useful ways. The option Directories... lets you specify additional directories for pk font files, ttt font files, and \TeX input files. The option DVI Fonts... gives some important choices for fonts. The option View Defaults... is for zoom level, page size, and orientation.

The next easy step is the creation of the format files. To create \texttt{plain.fmt}, choose \texttt{InitTeX}... from the Typeset menu (should we call it Create Format?); a dialog box comes up. Click on the \texttt{Plain TeX} radio button, then on the \texttt{OK} button, and you are done in a minute.

To test your installation, open the \texttt{test.tex} file and click on the \TeX icon on the toolbar. A black window called Typeset comes up and some messages appear: \texttt{PCTeX} for \texttt{Windows} calls \texttt{PCTeX} a DOS program. The black window is the "DOS box", and \texttt{PCTeX} typesets \texttt{test.tex}. After the typesetting, close the black window and click on the view icon (picturing a pair of glasses, cute). Now the view window comes up. This has to be adjusted to make the typeset document visible. The adjustment consists of several steps: 1. adjust the size and the placement of the window; 2. center the text; 3. adjust the magnification; 4. go to page; 5. move the text up or down.

At this point some of the rough edges of this new program show up. For instance, on my IBM Think Pad I use magnification level 5, which is just right, as one line is the width of my screen, except that a click on a left- or right-arrow is so crude that I cannot center the line on the screen; either the beginning or the end falls off. Now pretend that you view the typeset version, make some change in the document, and click on the \TeX icon to typeset again. The view window is closed, and coming back, you are where you started in the first place. The five steps must be repeated to view the corrected typeset version.

Of the five steps, step 4 is too complicated. Often, you want to go to a page by number. Here, this is a five-step procedure: select the View menu and choose Page, then choose Select, then type the page number, then click OK. It is preferable to use the keyboard shortcut: when the view window is open, type \texttt{Ctrl-P}, the page number, and press Enter.

Format files are very important for \TeX. They preprocess a lot of information for your article, so typesetting becomes much faster. As we mentioned before, the creation of the \texttt{plain.fmt} format file could not be simpler. The same is true of the basic \texttt{KTeX} and \texttt{AMS-\TeX} format files. Unfortunately, there is not much flexibility for anything else.

This, of course, affects the user. As a \texttt{KTeX} user, I would
like to have a “pure” \TeX format, another \TeX format with \documentstyle{article} (possibly with options) built in; in fact, even a third, with my standard macros built in, in addition to the document style.

There are some restrictions built into the system. The first is that there are only five format names. They are plain, \LaTeX, AMSTeX, Format1, and Format2. With a little work you can make an AMSTeX format file, but it will have to be called by one of these five names. Hopefully, in a future version, these restrictions will be removed.

I found it very easy to make a format file for my personal preference, AMAS-\TeX. I proceeded, then, to exercise this format with the article test file provided by the AMS and ran into another roadblock. The editor can handle only files that are less than 64K in size, and the test article is larger. So exercise AMAS-\TeX with booktest.tex instead, also provided by the AMS.

The restriction on the editor is surprising in the Windows environment, but it is no obstacle to writing long articles and books. \TeX's \input and \LaTeX's \input will help you get around this restriction.

Finally, we come to the fonts. \TeX uses rasterized fonts. \TeX for Windows standardized outline fonts, namely, TrueType outline fonts.

Outline fonts were the topic of Part I (see [2]), but only the PostScript CM and AMS fonts were discussed in detail. There I wrote:

With Windows 3.1 on the PC System 7 on the Mac came a competing outline font technology called TrueType. Presently, the number of TrueType fonts is rather small compared to the number of PostScript fonts, and there is no math font. This competition with Adobe resulted in the free distribution of ATM [Adobe Type Manager], a saving of about $150 to the user. We shall not be dealing with TrueType fonts in this article, although much that is said would apply to them.

So much for my foresight. The decision by Personal \TeX to go with TrueType CM fonts was, very likely, a commercial decision. It does not cost much to “translate” the original Metafont to TrueType. Unfortunately, the result is not of very high quality. This should not affect the average user. For a preprint, the quality is just fine. For a production run, you would probably switch to PostScript CM fonts.

The AMS fonts are not provided in TrueType form. However, you can continue using them in rasterized form by choosing DVI Fonts... in the Settings menu and clicking on the

\texttt{Search TrueType fonts, then PK fonts}

radio button. (I am informed that the TrueType AMSFonts should be available by the time you read this article.)

There is also an icon for a TFM Generator. This program generates \TeX font metric files from TrueType fonts to make them available for \TeX.

\section{Scientific Word}

There are two aspects of article design: the visual and the logical. In a \TeX article, the visual decisions are made by professional designers, so you can concentrate on the logical design.

\LaTeX uses four major tools to separate the logical and visual designs of an article:

\begin{itemize}
  \item \textbf{Commands.} Information can be given to \LaTeX as arguments of commands, then it is up to \LaTeX to handle the information. For instance, the title page information is given in this form; the organization of the title page is described in the document style.
  \item \textbf{Environments.} Important logical structures are placed in environments. For instance, you can give a list as an environment by saying that this is a list and these are the items. Again, how this is typeset is up to \LaTeX; you can even switch from one type of list to another by just changing the name of the environment.
  \item \textbf{Declarations.} These are (numbered) environments. The numbering scheme in the Declaration section can be changed at any time.
  \item \textbf{Cross-referencing.} Since a theorem or a section is written as a logical design, it, or a whole section or part of a section, can be freely moved around. This offers tremendous freedom in reorganizing the source file to improve the logical design.
\end{itemize}

The design philosophy of Scientific Word from TCI Software Research is very clear:

\begin{itemize}
  \item To separate the logical and visual design of the article.
  \item To help the user to enter and designate the logical parts separately.
  \item To make the entry of text and mathematics visual.
  \item To make available the advanced AMAS-\TeX constructs.
\end{itemize}

Version 1.1 of Scientific Word goes a long way in accomplishing these ambitious goals. The last goal, the merging of \TeX and AMAS-\TeX, was accomplished by the AMS with AMAS-\TeX (this is discussed in [1]) which came too late for TCI, so they wrote their own macros to make this happen. TCI is working to incorporate AMAS-\TeX in a future version.

When Scientific Word is started up, there are six menus and a double toolbar.

The File menu contains the usual items and a few items specific to Scientific Word. Doc Info allows the user to enter information about the document, such as comments, description, typist, created, last revised. There are three more items of a technical nature: \LaTeX, which contains a default

\begin{verbatim}
\input tcilatex,
\end{verbatim}

the default macro file; Document/Subdocument to take care of building a document from subfiles (it does the \includes); Front Matter... gives a box in which to enter Author, Title, Date, and Abstract. This is clearly in line with the design philosophy: the first three are arguments of commands, the last is an environment.

\section{Footnotes and Bibliographies}

The Footnotes menu allows you to add footnotes to your article. Each footnote is numbered and has a reference list at the end of the document. This is the default method for handling footnotes. It is possible to add notes to a section in the middle of the document. This is done by selecting a section in the Document window and pressing the Note button. The note is then added to the end of the section.\footnote{This is a footnote.}
These will require quite a bit of additional work. The implementation of a bibliography is made difficult by the fact that, in my opinion, the \texttt{AMS-\LaTeX} solution is not the best. The most flexible implementation of a bibliography is in \texttt{AMS-\LaTeX}, and it has not yet been incorporated into \texttt{AMS-\TeX}. The preamble is very complex to do; my younger son wrote a program that creates the preamble for up to two authors. Something like that program will have to be included in \texttt{Scientific Word}. Finally, there is the top matter which would require only the expansion of \texttt{Front Matter} from three to about fifteen items.

There is one more aspect of \texttt{Scientific Word} that needs to be emphasized: the designers do not want to force working in a certain way. They will often program two or three ways of doing the same task (the keyboard vs. the mouse, pull down menu vs. icons, etc.) so that you can choose the one that suits your work habits the best.

There is no major area to criticize in the design of \texttt{Scientific Word}. However, some small items come to mind. The Edit menu uses the old keyboard shortcuts (e.g., Shift+Del for Cut) instead of the new ones everybody is standardizing (Ctrl+Z, X, C, and V). There should be more customizable icons, in a third optional row: eighteen is not enough; maybe thirty-six is. The AMS font extension should be in the symbol tables. Presently, there are only two negated binary relations; the Calligraphic font is used instead of the more attractive Euler script, and there are no German letters.

The beautiful display of \texttt{Scientific Word} is, of course, not the same as the printed \TeX version. To see how \TeX will print it, choose \texttt{View} in the File menu. \texttt{Scientific Word} copies your file to a temporary file and invokes \texttt{Turbo\TeX} to typeset it; then the \texttt{Turbo\TeX DVI Translator} is called to show you the typeset version.

\texttt{Turbo\TeX} is a small \TeX, meaning that it will not do the job if the memory requirement is excessive (for instance, if the article uses many macros or cross-references). But worse than that, \texttt{Turbo\TeX} is slow. One of the sample documents provided by \texttt{Scientific Word} took sixteen seconds on another \TeX; it took fifty-six seconds on \texttt{Turbo\TeX}. And this was only one pass; normally, two passes are needed to process a \TeX document.

After the typesetting, the \texttt{Turbo\TeX DVI Translator} displays the typeset version. After a long delay, you see the typeset version placed in a window off center. To adjust the picture, click on the arrows (click on an arrow only once; the picture moves only after the arrow is released). Clicking anywhere in the window will show a magnified picture; however, since the (rasterized) fonts are not changed, the magnified picture looks awful. If you magnify with the Magnify menu, it takes a long time to get the magnified page, but the result is nice.

If you invoke the previewer again, it does not remember the page you were on or the previous position of the typeset page in the window, so everything has to be adjusted again.

The good news is that \texttt{Scientific Word} is not hard-wired to \texttt{Turbo\TeX}. With a text editor, open the file sciword.\texttt{ini} in the windows directory. In the file you find the [Text] group,
There are a number of ways we can compare the products. Here is an example: I am working on page 5 of a mathematical article. I make a change and press Command-T (typeset). Six seconds later I see the new page 5. (The rest of the article may take longer to typeset, but page 5 is already shown.)

As we saw in Scientific Word, the turnaround time is not very fast (but, of course, depends on the \TeX and the viewer installed). But users of Scientific Word would argue that you do not have to typeset in Scientific Word all that often—after all, you do see the formulas “typeset”. This is true, in part, but consider this: you want to have the following in your article:

\begin{verbatim}
\textit{This is a formula.}
\end{verbatim}

On the right using the \texttt{verbatim} environment. I do not know how to do this except by trial and error, requiring a number of typesettings. As another example, take a “line too long” error; it usually takes me a number of typesettings to correct one. For instance, I changed the font of the text of [3] from CM to Times. This caused 154 “line too long” errors. That takes a lot of turnarounds to correct.

If we compare the viewers, I think \textit{DVWin} does out ahead. It has very many nice features not matched by other viewers, including \textit{Lightning Textures}; the pages always coming up centered, the ease of cutting from the typeset page, the coloring and listing of fonts. On the other hand, the viewer of \textit{Lightning Textures} remembers pages and positions in the same session, a great advantage.

How flexible are the uses of format files? In \textit{PCTeX} for Windows we are restricted to five, of which three are named plain, \LaTeX, AMSTeX, and two are named Format!\texttt{a} and Format\texttt{b}; in \textit{Scientific Word} none are available directly; in \textit{Lightning Textures} we have complete flexibility.

Some comparisons are summarized in the following table.

| Turnaround time | Textures | PCTeX for Windows | Scientific Word | DVWin
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<tbody>
<tr>
<td>Viewer</td>
<td>very fast</td>
<td>fast</td>
<td>slow</td>
<td>fast</td>
</tr>
<tr>
<td>Editor</td>
<td>very good</td>
<td>good</td>
<td>poor</td>
<td>best</td>
</tr>
<tr>
<td>Magnification</td>
<td>simple, small</td>
<td>simple</td>
<td>simple</td>
<td>--</td>
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<tr>
<td>Files</td>
<td>flexible</td>
<td>fixed</td>
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<tr>
<td>Most recent</td>
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<td>yes</td>
<td>yes</td>
<td>no</td>
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<tr>
<td>Spelling</td>
<td>no</td>
<td>no</td>
<td>yes</td>
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5. Pros and Cons

There are a number of ways we can compare the products reviewed in this article.

For instance, we can compare turnaround times, that is, how long does it take to make some changes in the editor and see the change in the typeset version. In \textit{PCTeX} the turnaround time is long. Save the file, quit the editor, typeset the article with \textit{PCTeX}, call the viewer, then get to the right place.

In \textit{PCTeX} for Windows this process is much faster; however, since in the viewer all the adjustments need to be made anew, it is not as fast as it could be.

\textit{Lightning Textures} is the turnaround is very, very fast. Here is an example: I am working on page 5 of a mathematical article. I make a change and press Command-T (typeset). Six seconds later I see the new page 5. (The rest of the article may take longer to typeset, but page 5 is already shown.)

As we saw in \textit{Scientific Word}, the turnaround time is not very fast (but, of course, depends on the \TeX and the viewer installed), but users of \textit{Scientific Word} would argue that you do not have to typeset in \textit{Scientific Word} all that often—after

6. The Products

\textit{Lightning Textures} is published by Blue Sky Research; 503-222-9571.

\textit{PCTeX} for Windows (and Big \textit{PCTeX}) is published by Personal \TeX, Inc.; 415-388-8853.

You can obtain \textit{DVWin} and \textit{DVIPSone} from Y&Y; 508-371-3286.

\textit{DVWin} requires the Postscript CM and AMS fonts; these can be obtained from Blue Sky Research and Y&Y. The Postscript CM fonts for IBM compatible computers are also available from Personal \TeX.

\textit{Scientific Word} is available from TCI Software Research, Inc.; 505-522-4600.

References

Reviews of Mathematical Software

Xtal 1.0
Reviewed by Eric Schweitzer*

Introduction

Xtal is, according to the author, a “visual programming language for simulating scientific models”. It differs from any other language I have seen in that one does not “write” programs, one “draws” them. In the following I will attempt to describe this “language”, as well as remark on the ease of learning and use of the Xtal package.

Xtal was written by Ellis D. Cooper of Morphisms at 200 West 14th Street, New York, New York, USA, 10011. The phone number is 212-924-2739. Xtal is available from Morphisms at a listed price of $120 for the disk and manual. I did have occasion to talk to Dr. Cooper who was quite helpful in clearing up a misunderstanding that I had about the software.

Requirements

Xtal 1.0 is designed to run on an IBM compatible computer running Windows 3.0 or later. It requires 550K of conventional memory on a 286 or higher computer. The “examples provided ... work well enough on a 12 MHz IBM AT”, although “you get better results if the serial computer is a high speed machine”. 1 I ran Xtal on a 486 DX machine running at 33MHz with 8 MB RAM under Windows 3.1 and DOS 5.0. At no time did the performance of the package seem sluggish on this machine, though I did tend to play around with small examples and never built a program with more than six processors.

The “Language”

In Xtal a “program” consists of a collection of “processors”. One builds processors using a “point and click” accessed menu system. These processors contain states, various types of arrows (used to transition between states or send messages to other processors), and references to numerical variables. Within a processor, exactly one state is “active” at a given time. This state will at some point “time out”, passing control to another state and affecting variables and other processors via the arrows whose tails are attached to the state that just timed out.

There are three types of arrows: “signal”, “time out”, and “trigger”. Each arrow has a “tag”. A signal arrow points either to a variable box (which contains the value of a variable) or processor “proxy” box (which names another processor). If the signal arrow points to a variable box, then the tag contains a formula that affects the variable’s value (e.g., the tag 1 \* 1 ‘add‘ on an arrow pointing to the variable box named n1 will add 1 to n1). If the signal arrow points to a processor proxy box, then the tag contains a weighted symbol (like * 2 ‘x*’) that is sent to the indicated processor’s input buffer. This could be used to trigger a trigger arrow as below.

Time out arrows and trigger arrows point to other states within a processor. A time out arrow’s tag contains a real-valued formula that controls the amount of time before the selected state times out. A trigger arrow contains a set of weighted symbols. If this is matched by the contents of the processor’s input buffer, then that trigger is activated, and control passes to the state pointed to.

The whole program gets started with a “bang”, in which every active state times out at once. This resets the clocks of these states. The user can have the program set to “repeat bang” a number of times (up to a few thousand). One can think of the program cycling through three basic steps:

- advance the system’s clock one “tick”, and time out any active states scheduled to time out at that point;
- send signals from the timed out states to the indicated processors;
- check each processor’s input buffer for signals matching trigger arrows. If there is an exact match, change state in that processor. If not, clear the input buffer.

This language does not support recursion, nor are there many functions implemented. The lack of recursion would seem consistent with the author’s goal of modeling neural nets, as it seems impossible for such nets to do recursion.

Having used this language for a while, this reviewer thinks the concepts embodied have a certain charm. The language helps one to think “parallelly”, and once the user has gotten used to the interface, the ease of use and editing abilities gives a nice environment for “messing around” with parallelism. Such an environment would be well suited to an introductory course where getting the feel of parallelism is important, or perhaps as a front end for a “real” parallel computer where easy modification of a program is important.

Implementation

When you enter the Xtal environment, you see a screen with a menu bar at the top, a blank area below that, and three boxes below that (a Timing Diagram box, a To Do stack, and a Session Record box). One creates a processor box by clicking on the Processor menu and dropping a processor
Figure 1

Figure 2
Possible Improvements

Although the implementation of the above ideas is, for the most part, well done, there is room for improvement. For example, an arrow's tail must start at the edge of a state, and its head must be at the edge of an appropriate object. If the tail is attached, and the edge of the object one wishes to attach to is missed, a spot is dropped (where the arrow is allowed to bend) rather than the arrow's head. It would be easier to drop these arrows if the cursor somehow changed to indicate the appropriate place to drop the arrow head. Signal arrows are used for two different things: sending signals to another processor and changing variables. As such, the contents of the signal arrow's tags are different: formulae for the variable signals and weighted symbols for the processor proxy symbols. It would seem to make sense that there would be two different types of arrows for these two different things. Similarly, the error messages could well be more specific (e.g., why is $\ast 1 ^{\prime} x ^{\prime}$ a bad tag for a signal arrow?). Is it the wrong type of arrow, or is it that the "$s should really be $s$?"

Since all variables can be accessed globally, there should be some way to "guard" a variable. For example, what happens if two processors try to access the same variable at the same time? In this implementation, the problems of ill-defined results are avoided by allowing only one to add or subtract values from these variables; but should the language be expanded to allow other operations, this could be a problem.

One needs to be careful when using the real-valued functions in a time out arrow. These function names are case sensitive (a fact not mentioned in the documentation). If you use the Function menu to create the tags, there is no problem, but if you type in $\exp \text{Wait} 1$, you get an error message, because $\exp \text{Wait}$ is the function you want. ($\exp \text{Wait}$ is an exponential wait function.)

There are a few other minor but annoying points. The installation routine for Xtal is done in DOS, although one must run Windows to use the software. There are a few inconsistencies in window handling. For example, there are some dialog boxes that one can close by clicking in the upper left corner, while others can be closed only by clicking on an "accept" or "cancel" button. If a user is loading and saving a few different programs, he or she must navigate through the whole directory tree from the root to get to where the program is stored. It would be nice if a default directory could be set. Similarly, if you want to load a program while another is active, you are prompted to save the previous program before loading, even if the previous program had just been saved.

Perhaps the most notable need for improvement lies in the documentation. I found it rather confusing, not because it was incomplete (it is not) but because it uses unfamiliar terminology. For example, we've seen that processors communicate by (among other ways) passing values via global (or shared) variables. In fact, all variables are accessible to all processors, yet the terms "global" or "shared variables" don't appear in the documentation. (One should note that included in the review package was an advertisement for Xtal 1.0 that states that a program "is a diagram of intercommunicating processors and global variables", but this did not appear in the manual.) Similarly, I could find only one mention of the fact that a state's time before time out is given by the function in the time out arrow that calls it, and this was mentioned almost in passing (Xtal, pg. 5–10). This is not mentioned in the glossary, nor was such an important construct made obvious. This would make the documentation (and hence the program) difficult to use as introductory material.

The documentation is about sixty pages long. Over one-fourth of this is devoted to Dr. Cooper's philosophy of science and other "background" information that makes the documentation read, in part, like an advertisement of some kind. I think much of this could profitably be replaced by a clearer explanation of the software's workings.

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Data Desk 4.1

Reviewed by Roger Pinkham*

Data Desk is an extensive, thoughtfully designed software tool, enabling the user to conduct unfettered, exploratory data analysis and to follow leads and queries in an effortless and seamless manner. A singular feature of Macintosh software is that, with literally one or two exceptions, it all functions the same way. Knowledge about one piece of software provides a base of experience for running the next. This package is no exception. The author takes full advantage of the Macintosh graphical user interface; typing is at an absolute minimum. And, because the author is himself a user, the facilities are there.

For example, in a scatter plot one often notices a point which seems aberrant or noteworthy for some reason. You want to know which datum gave rise to it. Because files are

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generally linked, you can use the mouse to point to the point, and instantly find it is General Motors, IBM, etc. If you see a whole collection of points that are singular for some reason, you can take the mouse and literally encircle the collection, much as you would with a pencil; and henceforth these data will always be plotted in red or yellow or whatever color you choose, provided you are blessed with a color monitor. Otherwise, you can use some special symbol such as a plus sign, an asterisk, an x, etc. This means that in all subsequent plots, whether of the same nature as the original or not, these points will be instantly recognizable.

A splendid utilization of this tool is in conjunction with yet another exploratory aid. Three-dimensional scatter plots can be rotated or spun at will, the rate and direction of rotation determined by the user. These spinning plots produce a pronounced sense of three-dimensional depth. Marked points stand out like proverbial sore thumbs. Sometimes it is only by rotating a 3-D scatter plot that one notices a coherent collection of points that would have otherwise escaped attention.

For a multidimensional data set, one can have a simultaneous plot of every pair of variables. Where the variable would be plotted against itself, one sees a normal probability plot of the variable instead. Now, the ability to mark collections of points will always be plotted in red or yellow or whatever color you choose, provided you are blessed with a color monitor. Otherwise, you can use some special symbol such as a plus sign, an asterisk, an x, etc. This means that in all subsequent plots, whether of the same nature as the original or not, these points will be instantly recognizable.

There is a complete suite of regression diagnostics, the ability to make partial regression plots, transform variables to more revealing scales (Box-Cox transformations are included), do principal components analyses, and manufacture ANOVA and MANOVA. For scatter plots there are lowess and trewess to provide insightful “smooths”. For time series, there exists a battery of smoothers (as would be expected from an author who has made major contributions to the theory and understanding of data smoothing).

One can, of course, effortlessly make dotplots, histograms, and boxplots. Through dynamical linking one can even see where a subset of a given data set lies in a histogram of the entire set.

Cluster analysis is available with a variety of options, as are random numbers having standard distributions. The quantiles and probability levels for the standard distributions (F, t, normal, Binomial, Poisson, ...) are at one’s disposal. I have jokingly started telling friends and students that Data Desk does everything but make coffee in the morning.

Over the years, I have programmed much of what is available in Data Desk, as I suspect have many others who do exploratory data analysis, but it exists in a hodgepodge, not all in one language (much of mine is in APL), and not easy to link continuously and reassemble to do a given job. Data Desk provides a single, integrated, extensive, completely interactive environment to enable data exploration, and it should make teaching an introductory course in interactive data analysis a true delight.

The full-blown version of Data Desk can be obtained from Data Description, Inc., P. O. Box 4555, Ithaca, NY 14852; 607-257-1000, while the student version of Data Desk can be obtained from W. H. Freeman and Co., 41 Madison Ave., New York, NY 10010.

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**Correspondence**

I have some comments on the number theory package Numbers, reviewed in the Notices of the A.M.S. 39 (1992) 840-841.

While the package has much to commend it, the statement made about its ability to factorize numbers ("a 38 digit number was factorized in about 1 min. 38 sec.") is liable to lead to disappointment for users.

Obviously the time taken to factorize a number N depends greatly on N (if there are enough terminal zeros, one can use mental arithmetic); the parameters of the Pollard rho method can also affect the time considerably as will be seen below.

I constructed numbers N(n) with 2n decimal digits as the product of two arbitrarily chosen primes in the interval (9.10^{n-1}, 10^n). These were tried with Pollard rho polynomial z_2^{r+c} and starting value c, for various r and c. The results, obtained on a Cambridge PC, were as follows. (Times in seconds)

<table>
<thead>
<tr>
<th>n</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>r, c</td>
<td>1,1</td>
<td>.7</td>
<td>.5</td>
<td>2.1</td>
<td>12.2</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>1,3</td>
<td>.6</td>
<td>1.1</td>
<td>2.6</td>
<td>3.1</td>
<td>31.8</td>
</tr>
<tr>
<td></td>
<td>1,4</td>
<td>.3</td>
<td>1.1</td>
<td>3.7</td>
<td>12.3</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>2,1</td>
<td>.4</td>
<td>.9</td>
<td>1.5</td>
<td>10.5</td>
<td>64.9</td>
</tr>
<tr>
<td></td>
<td>2,2</td>
<td>.4</td>
<td>1.0</td>
<td>3.0</td>
<td>20.9</td>
<td>64.9</td>
</tr>
<tr>
<td></td>
<td>2,4</td>
<td>.6</td>
<td>.6</td>
<td>3.0</td>
<td>5.3</td>
<td>40.7</td>
</tr>
<tr>
<td></td>
<td>3,1</td>
<td>.4</td>
<td>.3</td>
<td>3.0</td>
<td>18.6</td>
<td>16.1</td>
</tr>
<tr>
<td></td>
<td>3,2</td>
<td>.2</td>
<td>.3</td>
<td>4.0</td>
<td>18.6</td>
<td>64.0</td>
</tr>
<tr>
<td></td>
<td>3,3</td>
<td>.6</td>
<td>2.1</td>
<td>1.5</td>
<td>9.1</td>
<td>64.0</td>
</tr>
</tbody>
</table>

For N(11) no result was obtained in 11 hours.

One might expect an increase of 1 in n to result in time being multiplied by about 10^{(1/2), and the low values of n support this. However, the increase in time for larger n is much greater, possibly because of the extra time needed for multithread working.

H.J. Godwin, Royal Holloway University of London; e-mail address: uhac001@vax.rhbnc.ac.uk.
News and Announcements

Elías Stein Receives Schock Prize

Elías M. Stein of Princeton University has received the Rolf Schock Prize in Mathematics. A linguist, an architect, and a composer also received the Schock Prizes of 400,000 Swedish Crowns (about $50,000) each, which were presented at a prize ceremony in Stockholm in November 1993. The prizes are presented by the Royal Swedish Academy of Sciences, the Royal Academy of Fine Arts, and the Royal Swedish Academy of Music. Stein was honored "for his fundamental contributions to the theory and applications of harmonic analysis".

Stein is the Albert Baldwin Dod Professor of Mathematics at Princeton. He received his bachelor's degree in 1951, his master's degree in 1953, and his doctorate in 1955, all from the University of Chicago. After two years as an instructor at the Massachusetts Institute of Technology, he returned to Chicago for four years before joining the Princeton faculty in 1963. He was a member of the Institute for Advanced Study in Princeton (1962-1963 and 1971-1972). He was a Sloan Foundation Fellow, a Senior Postdoctoral Fellow of the National Science Foundation, and a Guggenheim Fellow. He received honorary degrees from Peking University and the University of Chicago. In 1984 he won the AMS Steele Prize for his book *Singular Integrals and the Differentiability of Functions* (Princeton University Press, 1970).

Rolf Schock was born in France in 1933 of German parents who later emigrated to the U.S. He received a bachelor's degree in geology and psychology, with a minor in mathematics, and did postgraduate work in philosophy before moving to Sweden in 1960. He received his doctorate in 1968 from Uppsala University with a dissertation on certain deviant logics that make no existence assumptions. He became an assistant professor at Uppsala University in 1969, though for the most part he was an independent scholar in logic and philosophy without a permanent appointment. He died in an accident in December 1986 and bequeathed half of his considerable fortune, which he had inherited from his father, for prizes in the arts and sciences. This is the first time the Schock Prizes were awarded; they will be awarded every two years.

Margaret Wright Elected Next SIAM President

Margaret H. Wright of AT&T Bell Laboratories has been elected president of the Society for Industrial and Applied Mathematics (SIAM) to serve a two-year term beginning January 1, 1995. Wright has been SIAM vice-president-at-large since 1990. Avner Friedman of the Institute for Mathematics and its Applications at the University of Minnesota is currently president of SIAM.

Gödel Prize for Theoretical Computer Science

The Gödel Prize is awarded annually for an outstanding paper (or collection of papers) in the area of theoretical computer science that appeared in a journal during the previous six years. The award is sponsored jointly by the European Association for Theoretical Computer Science (EATCS) and the Special Interest Group on Algorithms and Computing Theory of the Association for Computing Machinery (ACM-SIGACT). This annual award is presented alternately at the International Colloquium on Automata, Languages, and Programming and the ACM Symposium on the Theory of Computing. Beginning in 1994, the Gödel Prize will be accompanied by a $5000 award funded by PWS Publishing Company and International Thomson Publishing.

The Gödel Prize is named in honor of Kurt Gödel, in recognition of his major contributions to mathematical logic and of his recently discovered early interest in what has become the famous "P versus NP" question. The prize was first awarded in 1993 for two papers: "Arthur-Merlin games: a randomized proof system and a hierarchy of complexity classes," (Journal of Computer and System Sciences 36 (1988), 254–276), by Laszlo Babai of the University of Chicago and Shlomo Moran of Technion-Israel Institute of Technology; and "The knowledge complexity of interactive proof systems," (SIAM Journal on Computing 18 (1989), 186–208), by Shafi Goldwasser and Silvio Micali of the Massachusetts Institute of Technology and Charles Rackoff of the University of Toronto.

These two papers introduced the concept of an interactive proof system, which provides a rich new framework for addressing the question of what constitutes a mathematical proof. The invention of this framework has already led to some of the most exciting developments in complexity theory in recent years, including the discovery of close connections between interactive proof systems and classical complexity classes, and the resolution of several major open
problems about the difficulty of finding near-optimal solutions to combinatorial optimization problems.

The 1994 Gödel Prize will be presented at the International Colloquium on Automata, Languages, and Programming in Jerusalem in July 1994.

CoProf Open Forum on Employment Issues at Eastern Sectional Meeting

The AMS Committee on the Profession (CoProf) will sponsor an open forum at the AMS Eastern Sectional Meeting at Polytechnic University, Brooklyn, NY, on April 9, 1994, on issues related to the employment of mathematicians.

The main purpose of the forum is to foster dialog and seek input from the community of mathematical scientists on the role that the AMS can take to improve employment opportunities in the mathematical sciences. Meeting participants will be given the opportunity to speak, and are welcome to provide written and oral testimony to support CoProf’s efforts in this area.

All members of the mathematics community, including those making oral presentations at the forum, are encouraged to contribute written statements to CoProf.

CoProf is currently reviewing actions that can be taken to extend the implementation of recommendations made in 1992 by the AMS Task Force on Employment. Contributors to the forum and others providing written statements are encouraged to consider those recommendations. The full text of “Employment and the U.S. Mathematics Doctorate: Report of the AMS Task Force on Employment, July 1992” is available on e-MATH GOPHER in the category “General Information of Interest to Mathematicians.”

Any member of the mathematics community who wishes to make an oral presentation is asked to notify James W. Maxwell at the AMS (e-mail: jwm@math.ams.org) before March 30, 1994. Oral presentations should be limited to five minutes in order to afford opportunities for broad participation. Priority for oral presentations will be given to meeting participants who register in advance, though all participants will be accommodated as time permits.

Written contributions should be submitted by March 30, 1994. Earlier contributions will facilitate the committee’s review of the Employment Task Force’s recommendations. Written statements can be sent by electronic mail to emp-forum@math.ams.org or mailed to the CoProf Subcommittee on Employment Issues, Attn: Diane Mack, American Mathematical Society, P.O. Box 6248, Providence, RI 02940.

CoProf anticipates sponsoring forums at other regional meetings as the need and opportunity arise.

Algebra, Complex Analysis, Optimization, and Topology, six students, nine weeks. Contact: Steven L. Blum-sack, Department of Mathematics, Florida State University, Tallahassee, FL 32306; telephone: 904-644-2488; fax: 904-644-4053; e-mail: blumsack@math.fsu.edu.

Matrix Theory and its Applications, six students, eight weeks. Contact: John H. Drew, Department of Mathematics, College of William and Mary, Williamsburg, VA 23187; telephone: 804-221-2025; fax: 804-221-2988; e-mail: jhdrew@wmvm1.

Operations Research, Probability, Graph Theory, Continued Fractions, and Combinatorics, six students, two months. Contact: Clifford A. Reiter, Department of Mathematics, Lafayette College, Easton, PA 18042; telephone: 215-250-5277; fax: 215-250-9850; e-mail: reiterc@lafcol.lafayette.edu.

Computational Group Theory and Graph Theory, six students, eight weeks. Contact: Rhonda L. Hatcher, Department of Mathematics, Texas Christian University, Fort Worth, TX 76129; telephone: 817-921-7335; fax: 817-921-7333; electronic mail: hatcher@gamma.is.tcu.edu.

Selected Topics, ten students, eight weeks. Contact: Susanne M. Lenhart, Department of Mathematics, University of Tennessee, Knoxville, TN 37996; telephone: 615-974-2461; fax: 615-974-6576; electronic mail: lenhart@mathsun10.math.utk.edu.

Discrete Mathematics, Combinatorics, and Graph Theory, six students, ten weeks. Contact: Joseph A. Gallian, Department of Mathematics, University of Minnesota-Duluth, Duluth, MN 55812; telephone: 218-726-7576; fax: 218-726-6360; e-mail: jgallian@ub.d.umn.edu.

Algebra, Topology, and Applied Mathematics, eight students, eight weeks. Contact: Darrell Haile, Department of Mathematics, Indiana University, Bloomington, IN 47402; telephone: 812-855-2197; fax: 812-855-0046; e-mail: haile@iubacs.bitnet.

Selected Topics, ten students, eight weeks. Contact: Dennis J. Garity, Department of Mathematics, Oregon State University, Corvallis, OR 97331; tele-
News and Announcements

This summer, the National Science Foundation (NSF) will fund eight Calculus Reform Workshops. The purpose is to disseminate information on the major calculus reform projects and to provide participants with an in-depth experience in one of the projects. All of the instructors have been intimately involved in the development of the project that they will be presenting. Five important threads will be woven through each workshop:

- Participant involvement as a student under the pedagogy being promoted by the Calculus Reform Movement.
- In-depth experience in the reform project associated with the instructors.
- Experience in the use of technology (computers, calculators) for teaching mathematics.
- Participant contribution (my "favorite" problem, curriculum topic development, evaluation).

Early applications are encouraged as enrollments are limited. All workshop expenses except for participant travel are paid by the NSF.

Listed below are the titles, dates, students, and phone numbers of the local contacts for each workshop. For information and application forms, call or write the local contact person.

**Harvard Consortium Program**, May 22–27, 1994, Karen and Joe Thrash of the University of Southern Mississippi; local contact: Mike Pearson, Department of Mathematics, Mississippi State University, Mississippi State, MS 39762; telephone: 601-325-3414.

**Core Approach to Calculus**, June 5–10, 1994, Don Small of the U.S. Military Academy; local contact: Captain Morgan Cornstubble, Department of Mathematical Sciences, USMA, West Point, NY 10996; telephone: 914-938-5987.

**Oregon State Program**, June 5–10, 1994, Tom Dick of Oregon State University; local contact: Jack Porter, Department of Mathematics, University of Kansas, Lawrence, KS 66043; telephone: 913-864-4367.

**Calculus in a Real & Complex World**, June 19–24, 1994, Frank Wattenberg of the University of Massachusetts, Dick Rogers and Jim Peters of Weber State University; local contact: Kendall Hyde, Department of Mathematics, Weber State University, Ogden, UT 84408-1702; telephone: 801-626-6095.

**Project Calc**, June 19–24, 1994, David Smith, Lang Moore, Sam Morris of Duke University, Marcelle Bessman of Frostburg State University; local contact: Sunny Norfleet, St. Petersburg Junior College, Clearwater, FL 34624; telephone: 813-791-2561.

**Calculus in Context**, June 27–July 1, 1994, Ken Hoffman of Hampshire College; local contact: Janet Beery, Department of Mathematics, University of Redlands, Redlands, CA 92373; telephone: 909-793-2121.


**Calculus with Mathematica**, July 31–August 5, 1994, Bill Davis of the Ohio State University; local contact: Tom Ralley, Department of Mathematics, Ohio State University, Columbus, OH 43310; telephone: 614-292-2254.
Call for Nominations for Schafer Prize
The Association for Women in Mathematics (AWM) calls for nominations for the Alice T. Schafer Prize, to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical sciences community are invited to submit nominations for the prize. The nominee may be at any stage of her undergraduate career.

The letter of nomination should include, but not be limited to, an evaluation of the nominee based on the following criteria: quality of performance in mathematics, exhibition of real interest in mathematics, ability for independent work, and performance in mathematical competitions at the local or national level, if any. Supporting materials, if any, should be enclosed with the nominations.

One original and four copies of the nomination materials must be received by April 1, 1994, and should be sent to: Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 4114 Computer and Space Science Building, University of Maryland, College Park, MD 20742; e-mail awm@math.umd.edu. For a list of last year’s awardees, see the Notices, July/August 1993, pages 642–643.

News from the Institute for Mathematics and its Applications
University of Minnesota

Important sources for IMA academic year and summer programs are program proposals and ideas for proposals submitted by members of the research community. If you are interested in submitting a proposal for a future IMA program please contact the Director, A. Friedman.

The IMA 1993–1994 academic year program Emerging Applications of Probability continues, with the guidance of the coordinators, J. Michael Steele (chairman), D. Aldous, P. Diaconis, R. Durrett, and L. Shepp. Details concerning the winter segment of the program, Mathematical Genetics; Queuing Networks, January 2–March 31, 1994, can be found in the September Notices, and those for the spring segment, Probability in Geo-systems, April 1–June 30, 1994, can be found in the December Notices.

The special workshop Applications of Mathematics in Manufacturing Logistics will be held at the IMA on June 20–24, 1994. Organizers include G. McDonald (General Motors), L. McGinnis (Georgia Tech), and R. Roundy (Cornell). The workshop will focus on the application of mathematical models and methods to logistical issues that arise in manufacturing environments. The specific areas of manufacturing applications include planning production; scheduling production; scheduling the resources that are required for production; the study and control of material flow in manufacturing systems (including justintime manufacturing and kanban systems); and the management of inventories of raw materials, of work in process, and of finished goods. The participants will include professionals from the private sector with interest and expertise in manufacturing logistics, academicians from engineering and business who study the application areas mentioned above, and mathematicians who are interested in learning more about manufacturing-related issues and problems.

From July 5–29, 1994, the IMA will present a summer program on Molecular Biology. The Organizers are M. Waterman, T. P. Speed, G. Myers, J. P. Mesirov, K. Schulten, and De Witt Sumners. More details concerning the Molecular Biology program and the upcoming Waves and Scattering academic year program will appear in future issues of the Notices.

During August 1–19, 1994, the IMA will feature a new summer program for mathematics faculty: Mathematical Modeling for Instructors. The goal is to provide experience in the use of mathematical modeling to solve problems which come from industry and engineering for thirty-two college/university instructors of undergraduates so that they can incorporate their experience and newly acquired skills in either enrichment of existing math courses or development of new undergraduate courses in math modeling. The instructors will solve these problems in teams coached by tutors. The tutors are D. Drew, P. Hagan, E. Cumberbatch, G. Young, D. Ross, and C. Please. Applications are due by March 15. See the advertisement in this issue.

For more information about IMA activities see the Meetings and Conferences section of this issue or contact the IMA at ima-staff@ima.umn.edu. Also, weekly IMA seminar schedules with titles and abstracts are available on Usenet: umn.math.dept and by fingering seminar@ima.umn.edu. LaTeX files for the Newsletter and the Update are available via anonymous ftp (at ftp.ima.umn.edu) or gopher (at gopher.ima.umn.edu).

Erratum
The December 1993 issue of the Notices, page 1443, carried an announcement about the mathematical sessions at the annual meeting of the American Association for the Advancement of Science in San Francisco in February 1994. The announcement incorrectly stated that Elliott Lieb would present the Frontiers of Physical Science Lecture. Robert Osserman will deliver that lecture on the subject, “The Mathematics of Cosmology”.

NOTICES OF THE AMERICAN MATHEMATICAL SOCIETY
**Funding Information for the Mathematical Sciences**

### Summer Internships in Probability and Stochastic Processes

National Science Foundation funding is anticipated for continued support for the summer internship program for recent Ph.D. recipients in probability and stochastic processes. The program will again be held at the Center for the Mathematical Sciences at the University of Wisconsin, Madison. The objective of the internship program is to stimulate and enhance the scientific development of capable young researchers. Opportunities will be provided for day-to-day interaction with senior researchers from the University of Wisconsin, access to the major research library and other research facilities of the university, establishment of continuing contacts and collaboration with other participants in the program, and advice and support in developing long-term research plans.

The seven-week program will begin June 27, 1994, and run through August 12, 1994. The program this summer will be directed by M. Bramson, D. Griffeath, C. Neuhauser, and R. Pemantle of the University of Wisconsin, Madison. The focus will be probability theory and its application to mathematical physics and biology. Likely topics include percolation theory, interacting particle systems, random cellular automata, critical exponents, and population genetics. Featured speakers will be Professors Geoffrey Grimmett of Cambridge University, Gregory Lawler of Duke University, and Simon Tavaré of the University of Southern California.

An applicant must have received a Ph.D. in some area of probability or stochastic processes since January 1989. In order to receive funding, an applicant must also be a U.S. citizen or permanent resident or hold a tenured or tenure-track position at a U.S. college or university. Individuals whose regular position is isolated from active research groups in probability and stochastic processes are particularly encouraged to apply.

For further information and application forms write to: Probability Intern Program, Center for the Mathematical Sciences, University of Wisconsin-Madison, 1308 West Dayton Street, Madison, WI 53715-1149; or telephone T. Kurtz at 608-263-4659. The e-mail address is pip@cms.wisc.edu. All materials must be received by March 1, 1994, in order to ensure full consideration. Materials may be submitted by e-mail. Selection of participants should be completed by April 1.

### Mittag-Leffler Grants

The Mittag-Leffler Institute announces the availability of a number of grants for the year 1994–1995. The program of the Institute starts on September 1, 1994, and ends on May 31, 1995. The grants are intended for recent Ph.D.s or advanced graduate students and amount to 10,000 Swedish crowns per month, or 100,000 Swedish crowns for those who attend for the duration of the program. Preference will be given to applications for longer stays.

The subject for 1994–1995 is Statistical Mechanics and Stochastic Analysis. The emphasis will be on statistical mechanics, nonlinear partial differential equations, and turbulence during the fall term and on stochastic analysis and stochastic processes during the spring term.

The following experts have agreed to take part in the program for extended periods: Erik Aurell, Björn Birnir, Béla Bollobás, Jean Bricmont, Pierre Collet, Peter Constantin, Bruce Driver, Eugene Dynkin, Jean-Pierre Eckmann, Uriel Frisch, Nigel Goldenfeld, E. H. Hauge, Kurt Johansson, Thordur Jonsson, Klaus Kirchgaessner, Andrew Majda, Paul Malliavin, Anders Martin-Löf, David Nualart, Yoshi Oono, Jürgen Potthoff, Itamar Procaccia, Michael Steele, Dan Stroock, Vladimir Vatutin, Eugene Wayne, Michael Weinstein, and Jack Xin. The program is organized by Antti Kupiainen during the fall and by Bernt Øksendal and Peter Jagers during the spring.

Applicants should submit application forms, which are obtainable from the institute. Requests for application forms can also be sent via e-mail to karin@kva.se. Applications should be sent before March 31, 1994, to: The Board of the Mittag-Leffler Institute, Auravägen 17, S-182 62 Djursholm, Sweden. Decisions on awards will be made by mid-April 1994.

Inquiries may be directed to: Antti Kupiainen, Department of Mathematics, P.O. Box 4, FIN-00014 University of Helsinki, Finland (electronic mail: ajkupiai@cc.helsinki.fi); or Bernt Øksendal, Department of Mathematics, University of Oslo, Postboks 1053 Blindern, N-0316 OSLO, Norway (e-mail: oksendal@math.uio.no).

### Fulbright Scholar Awards Competition

The Fulbright Scholar Program provides grants for university lecturing or advanced research in nearly 140 countries.
Awards range from two months to a full academic year, and many assignments are flexible according to the needs of the grantee. The basic eligibility requirements for a Fulbright Scholar award are U.S. citizenship and a doctorate or comparable professional qualifications. For lecturing awards, university or college teaching experience is expected. Language skills are needed for some countries, but most lecturing assignments are in English.

The deadline is August 1, 1994, for research or lecturing grants, but other deadlines apply for special programs. For further information and application materials contact: Council for International Exchange of Scholars, 3007 Tilden Street, NW, Suite 5M, Box GNEWS, Washington, DC 20008-3009; telephone: 202-686-7877. Application requests only may be sent by electronic mail to ciesl@gwuvn.gwu.edu.

New NSF Program
The National Science Foundation has announced a new initiative: Mathematical Sciences and Their Applications Throughout the Curriculum. Projects supported in the initiative are expected to lead to increased student understanding in the mathematical sciences and increased student ability to apply the mathematical sciences in other disciplines.

The interdisciplinary characteristic of the initiative is central and will require strong support across academic units and development by mathematical sciences faculty in partnership with faculty in other disciplines. Projects are also expected to have a pervasive impact on the mathematical sciences and the other departments involved, building on such efforts to improve undergraduate education as the calculus reform movement. In addition to changes in course content, projects should involve a full range of goals such as improving student learning through alternative instructional practices, the effective use of computational technologies, and increasing the diversity of students who are attracted to and successful in disciplines requiring a foundation in the mathematical sciences.

Projects could involve the entire mathematical sciences curriculum or be more focused; for example, the calculus curriculum, including courses that led to and follow calculus, and its applications in other disciplines. Consideration of other segments of the curriculum is also encouraged.

This initiative is a next step to the NSF Calculus and Bridge to Calculus Program and replaces that program. However, continuing the progress made in the area of calculus remains a high priority for NSF. Support for projects in calculus that do not have the interdisciplinary or other features expected in this initiative is available through the Course and Curriculum Program (development of new curriculum and large scale adaptation and implementation projects), the Instrumentation and Laboratory Improvement Program (matching funds for equipment), the Undergraduate Faculty Enhancement Program (workshops for faculty), and the Advanced Technological Education Program. All of these programs are described in the new Division of Undergraduate Education Program Announcement (NSF-93-164).

Initially, NSF expects to award 10–20 planning grants of up to $50,000. It is expected that these planning grants will provide a basis for the preparation of comprehensive proposals that will lead to a few awards of up to $1 million per year for 3–5 years. Information concerning this new initiative is available in an addendum to NSF-93-164 and is available by calling 703-306-1669. Due date for the proposals for planning grants is June 6, 1994, with full proposals due February 6, 1995.
1994 AMS Election

Nominations by Petition

Vice-President or Member-at-Large
One position of vice-president and member of the Council ex officio for a term of three years is to be filled in the election of 1994. The Council intends to nominate at least two candidates, among whom may be candidates nominated by petition as described in the rules and procedures.

Five positions of member-at-large of the Council for a term of three years are to be filled in the same election. The Council intends to nominate at least ten candidates, among whom may be candidates nominated by petition in the manner described in the rules and procedures.

Petitions are presented to the Council, which, according to Section 2 of Article VII of the bylaws, makes the nominations.

The Council of 23 January 1979 stated the intent of the Council of nominating all persons on whose behalf there were valid petitions.

Prior to presentation to the Council, petitions in support of a candidate for the position of vice-president or of member-at-large of the Council must have at least fifty valid signatures and must conform to several rules and operational considerations, which are described below.

Editorial Boards Committee
Two places on the Editorial Boards Committee will be filled by election. There will be four continuing members of the Editorial Boards Committee.

The President will name at least four candidates for these two places, among whom may be candidates nominated by petition in the manner described in the rules and procedures.

The candidate’s assent and petitions bearing at least 100 valid signatures are required for a name to be placed on the ballot. In addition, several other rules and operational considerations, described below, should be followed.

Nominating Committee
Three places on the Nominating Committee will be filled by election. There will be six continuing members of the Nominating Committee.

The President will name at least six candidates for these three places, among whom may be candidates nominated by petition in the manner described in the rules and procedures.

The candidate’s assent and petitions bearing at least 100 valid signatures are required for a name to be placed on the ballot. In addition, several other rules and operational considerations, described below, should be followed.

Rules and Procedures
Use separate copies of the form for each candidate for vice-president, member-at-large, or member of the Nominating and Editorial Boards Committees.

1. To be considered, petitions must be addressed to Robert M. Fossum, Secretary, P. O. Box 6248, Providence, Rhode Island 02940, and must arrive by 28 February 1994.

2. The name of the candidate must be given as it appears in the Combined Membership List (CML). If the name does not appear in the list, as in the case of a new member or by error, it must be as it appears in the mailing lists, for example on the mailing label of the Notices. If the name does not identify the candidate uniquely, append the member code, which may be obtained from the candidate’s mailing label or the Providence office.

3. The petition for a single candidate may consist of several sheets each bearing the statement of the petition, including the name of the position, and signatures. The name of the candidate must be exactly the same on all sheets.

4. On the next page is a sample form for petitions. Copies may be obtained from the secretary; however, petitioners may make and use photocopies or reasonable facsimiles.

5. A signature is valid when it is clearly that of the member whose name and address is given in the left-hand column.

6. The signature may be in the style chosen by the signer. However, the printed name and address will be checked against the Combined Membership List and the mailing lists. No attempt will be made to match variants of names with the form of name in the CML. A name neither in the CML nor on the mailing lists is not that of a member. (Example: The name Robert M. Fossum appears not to be.)

7. When a petition meeting these various requirements appears, the secretary will ask the candidate to indicate willingness to be included on the ballot. Petitioners can facilitate the procedure by accompanying the petitions with a signed statement from the candidate giving consent.
NOMINATION PETITION FOR 1994 ELECTION

The undersigned members of the American Mathematical Society propose the name of

_____________________________
as a candidate for the position of (check one):

☐ Vice-President
☐ Member-at-Large of the Council
☐ Member of the Nominating Committee
☐ Member of the Editorial Boards Committee

doing the American Mathematical Society for a term beginning 1 February, 1995.

Name and Address (printed or typed)

_____________________________
Signature

_____________________________
Signature

_____________________________
Signature

_____________________________
Signature

_____________________________
Signature

_____________________________
Signature

_____________________________
Signature
University of Kentucky, Lexington, Kentucky
March 18–19, 1994

Second Announcement

The eight hundred and ninetieth meeting of the American Mathematical Society (AMS) will be held at the University of Kentucky, Lexington, Kentucky, on Friday and Saturday, March 18–19, 1994.

Invited Addresses
Jack Dongarra, Oak Ridge National Laboratory and University of Tennessee, Recent work in parallel algorithms for linear algebra.
David R. Morrison, Institute for Advanced Study, Mirror symmetry and the quantum moduli space of Calabi-Yau manifolds.
James E. McClure, Purdue University, Applications of Hochschild and Andre-Quillen homology to homotopy theory.
George F. McNulty, University of South Carolina, Avoiding combinatorial patterns in strings of symbols.

Special Sessions
Infinite groups and group rings, James C. Beidleman and Donald B. Coleman, University of Kentucky.
Geometric group theory and metric geometry, Philip L. Bowers, Florida State University.
Partial differential equations and minimal smoothness conditions, Russell M. Brown and John L. Lewis, University of Kentucky, and Zhongwei Shen, Purdue University.
Graph theory, Karen L. Collins, Wesleyan University, and Ewa M. Kubicka, University of Louisville.
Collaborative learning in calculus and precalculus, Michael B. Freeman, University of Kentucky.
Inverse spectral problems: theory and computation, Peter D. Hislop and Peter Perry, University of Kentucky.
Homotopy theory, Mark A. Hovey, University of Kentucky, and James E. McClure.
Combinatorics of words and equations in algebra, logic, and computer science, George F. McNulty.
Quantum algebraic geometry, David R. Morrison, Institute for Advanced Study.
Elliptic genera and elliptic cohomology, Serge Ochanine, University of Kentucky.
Mathematics of many-body quantum theory, M. Beth Ruskai, University of Massachusetts at Lowell.

Accommodations
Rooms have been blocked in the following hotels. An NCAA Regional Men’s Basketball Tournament is scheduled in Lexington for the weekend of March 18, so participants are advised to make reservations early. Participants should make their own arrangements with the hotel of their choice. The AMS is not responsible for rate changes or the quality of the accommodations offered by these hotels/motels.


Registration
The meeting registration desk will be located in the main foyer on the ground floor of the Business and Economics Building, which is near the main gate on South Limestone Street, and will be open from 7:30 a.m. to 5:00 p.m. on Friday, March 18, and 7:30 a.m. to noon on Saturday, March 19. The registration fees are $30 for members of the AMS, $45 for nonmembers, and $10 for emeritus members, students, or unemployed mathematicians.

Travel
Delta has been selected as the official airline for this meeting. The following benefits are available exclusively to mathematicians and their families attending the meeting: a savings of up to 10% off any published domestic fare (includes U.S., Canada, Bermuda, the Bahamas, Puerto Rico, and the U.S. Virgin Islands), subject to applicable fare restrictions, is available. Seats are limited. Call 1-800-241-6760 between 8:00 a.m. and 11:00 p.m. EST to contact Delta directly or call any licensed travel agent. Instruct the ticket agent to refer to file MO456 in order to qualify for the applicable discount.
The eight hundred and ninety-first meeting of the American Mathematical Society will be held at Kansas State University in Manhattan, Kansas, on Friday, March 25, and Saturday, March 26, 1994. All sessions will be held in Cardwell Hall and Waters Hall.

**Invited Addresses**

**Marilyn Breen**, University of Oklahoma, *Krasnosel'ski-type theorems in orthogonal polygons.*

**Michael C. Cranston**, University of Rochester, *On coupling in applications of probability to analysis.*

**David M. Goss**, Ohio State University, *Zeta functions of characteristic p arithmetic.*

**Mei-Chi Shaw**, University of Notre Dame, *Solvability and estimates for the tangential Cauchy-Riemann operators.*

**Special Sessions**

**Harmonic analysis and probability**, Andrew G. Bennett and Charles N. Moore, Kansas State University.

**Groups and geometries**, Andrew L. Chermak and Albert L. Delgado, Kansas State University.

**Quantum topology**, Louis Crane and David Yetter, Kansas State University.

**Global fields**, David M. Goss, Ohio State University; Michael I. Rosen, Brown University; and Dinesh Thaker, University of Arizona.

**Special functions**, Robert A. Gustafson, Texas A&M University.

**Several complex variables and partial differential equations**, A. Alexandrou Himonas, Institute of Advanced Study, and Mei-Chi Shaw.

**Nonlinear topics and critical phenomena in partial differential equations**, Lev Kapitanski and Lige Li, Kansas State University.

**Representations of algebraic groups and quantum groups**, Zongzhu Lin and David B. Surowski, Kansas State University.

**Operator theory**, Gabriel Nagy, Kansas State University, and Vladimir V. Peller, University of Hawaii.

**Convergence problems in ergodic theory**, Joseph M. Rosenblatt, Ohio State University.

**Dynamical systems and fluid dynamics**, Misha Vishik, University of Texas at Austin.

**Computational mathematics and numerical analysis**, Hu-nan Yang and Qisu Zou, Kansas State University.

The deadline for submission of abstracts for consideration in any of these sessions has expired. There will also be sessions for contributed ten-minute papers. This deadline has also expired.

**Accommodations**

Rooms have been blocked for participants at the Ramada Inn, Best Western Continental Inn, and Days Inn. Participants should make their own arrangements directly with the hotel of their choice and request the AMS conference rate to obtain the rate listed. **All rooms will be on a space-available basis after March 8, 1994.** The AMS is not responsible for rate changes or the quality of the accommodations offered by these hotels/motels.

**Ramada Inn** (0.2 mile to Cardwell Hall): 17th and Anderson Avenue, Manhattan, KS 66502. Telephone: 913-539-7531. Single $57 and Double $63.

**Best Western** (1.2 miles to Cardwell Hall): 100 Bluemont Avenue, Manhattan, KS 66502. Telephone: 800-452-5111 or 913-776-4771. Single or Double $54 ($4 each additional person).

**Days Inn** (1.7 miles to Cardwell Hall): 1501 Tuttle Creek Boulevard, Manhattan, KS 66502. Telephone: 800-325-2525 or 913-539-5391. Rooms are $50 (2 double beds, 1–4 people).

Other hotels/motels in the area are the Holiday Inn (1.8 miles to Cardwell Hall), tel: 913-539-5311; Super 8 Motel (1.6 miles to Cardwell Hall), tel: 913-537-8468 or (800) 800-8000; and Motel 6 (1.3 mile to Cardwell Hall), tel: 913-537-1022.

**Registration**

The registration desk will be located inside the main entrance to Cardwell Hall and will be open from 8:00 a.m. to 5:00 p.m. on Friday, March 25, and from 8:00 a.m. to noon on Saturday, March 26. The registration fees are $30 for members of the AMS, $45 for nonmembers, and $10 for emeritus members, students, or unemployed mathematicians.

**Social Events**

A cash bar reception will be held on Friday evening from 8:00 p.m. to 11:00 p.m. at the Ramada Inn located just south of the Kansas State campus.

**Travel**

USAir is the official airline for this meeting. The following benefits are available exclusively to mathematicians and their families attending the meeting: 10% discount off any published domestic fare with a seven-day advance purchase. Call USAir’s Meetings and Convention Reservation Office at 1-800-334-8644 between 8:00 a.m. and 9:00 p.m. EST or call any licensed travel agent. Instruct the agent to refer to gold file #16950015 in order to qualify for the applicable discount.
Polytechnic University, Brooklyn, New York
April 8–10, 1994

First Announcement

The eight hundred and ninety-second meeting of the American Mathematical Society (AMS) will be held at Polytechnic University, Brooklyn, New York, on Friday, Saturday, and Sunday, April 8–10, 1994.

Invited Addresses
David Bayer, Columbia University, title to be announced.
Peter B. Kronheimer, Merton College, Embedded surfaces in 4-manifolds.
Debasis Mitra, AT&T Bell Labs, title to be announced.
Nicholai Reshetikhin, University of California, Berkeley, title to be announced.

Special Sessions
Computational geometry, Boris Aronov, Polytechnic University.
Mathematical problems in molecular biology, Craig J. Benham, Mt. Sinai Medical Center.
Invariants of low dimensional manifolds, Joan S. Birman, Columbia University; Sylvain E. Cappell, NYU Courant Institute; and Edward Miller, Polytechnic University.
Geometric analysis, Jozef Dodziuk and Edgar A. Feldman, Graduate School and University Center, CUNY.
Combinatorial group theory and related topics, Benjamin Fine, Fairfield University; Anthony M. Gaglione, United States Naval Academy; and Kathryn Kulken, Polytechnic University.
Teichmüller theory and dynamical systems, Frederick P. Gardiner and Yunping Jiang, Brooklyn College, CUNY.
Analytic number theory, Dorian Goldfeld, Columbia University.
Geometric convexity, Jacob E. Goodman and Erwin Lutwak, Polytechnic University.
Topological methods; topological measure theory, Paosheng Hsu, University of Maine, Orono, and L. Narisi, St. Johns University.
Partial differential equations, Yanyan Li, Rutgers University.
Discrete geometry, Janos Pach, New York University, and William Steiger, Rutgers University.
Mathematical methods in plasma physics, Kurt S. Riedel, NYU Courant Institute.
Gauge theory and applications, Robert J. Sibner, Brooklyn College, CUNY.
Models in telecommunications, Alan A. Weiss, AT&T Bell Labs.

There will also be sessions for contributed ten-minute papers. The deadline for submission of abstracts for these sessions has expired. Unfortunately, late papers cannot be accommodated.

Accommodations
Rooms have been blocked in the following hotels. Participants should make their own arrangements with the hotel of their choice. The AMS is not responsible for rate changes or the quality of the accommodations offered by these hotels/motels. The deadline for reservations is March 17, 1994.

Barbizon Hotel: 140 East 63rd St., New York, NY 10021. Telephone: 800-223-1020 or 212-838-5700 (within New York only). Single $90 and double $95 (with queen bed $110).

Council
The Council of the Society will meet on Saturday, April 9, 1994, at the Barbizon Hotel, located at 140 East 63rd Street at Lexington Avenue, New York, New York 10021.

Open Forum
The AMS Committee on the Profession (CoProf) (M. Salah Baouendi, chair) will host an open forum on Saturday afternoon, April 9, on issues related to the employment of mathematicians. The main purpose of the forum is to foster dialog and seek input from the community of mathematical scientists on the role that the AMS can take in improving employment opportunities. Meeting participants will be given the opportunity to speak and are urged to provide written testimony to support CoProf’s efforts in this area. Additional information on submission of written contributions and on participation in the CoProf Forum, is included in the News and Announcements section of this issue of the Notices.

Other Events of Interest
Raoul Bott, Harvard University, will present the Magnus Lectures on Thursday, April 7, and Friday, April 8, at 4:00 p.m.

Registration
The registration fees are $30 for members of the AMS; $45 for nonmembers; and $10 for emeritus members, students, or unemployed mathematicians. There will also be a special one-day registration fee of $20.
Invited Addresses, Special Sessions, and Contributed Papers

Invited Addresses at AMS Meetings
The individuals listed below have accepted invitations to address the Society at the times and places indicated. For some meetings the list of speakers is incomplete. For full announcements or programs of meetings occurring prior to the first meeting listed below see the table of contents in this issue. Invited addresses at Sectional Meetings are selected by the Section Program Committee, usually twelve to eighteen months in advance of a meeting. Members wishing to nominate candidates for invited addresses should send relevant information to the associate secretary for the section who will forward it to the Section Program Committee.

Eugene, OR, June 1994
Stephen A. Mitchell
Gustavo A. Ponce

Minneapolis, MN, August 1994
George E. Andrews
(History of Mathematics Lecture)
Todd J. Arbogast
(CAMMA)
Cameron Gordon
(CAMMA)

Carole B. Lacampagne
(AMS-MAA)
Pierre Louis Lions
(Progress Lecturer)

October 1994 Meeting in Stillwater, Oklahoma
Central Section
Associate Secretary: Andy R. Magid
Deadline for organizers: Expired
Deadline for consideration: July 13, 1994

Stillwater, OK, October 1994
V. Lakshmibai
David J. Wright

David E. Marker
Joel Zinn

Loren D. Pitt
Doron Zeilberger

Cora S. Sadosky

Richmond, VA, November 1994
Ben F. Logan
Kari Vilonen

Nina N. Uraltseva
Shouwu Zhang

Organizers and Topics of Special Sessions
The list below contains all the information about special sessions at meetings of the Society available at the time this issue of the Notices went to the printer.

June 1994 Meeting in Eugene, Oregon
Western Section
Associate Secretary: Lance W. Small
Deadline for organizers: Expired
Deadline for consideration: March 14, 1994

Frank W. Anderson and Kent R. Fuller, Rings and their representations
Steve A. Bleiler, 3-manifolds
Frank R. Demeyer and Thomas M. McKenzie, Commutative algebra and probability groups
Paul G. Goerss and Stephen A. Mitchell, Algebraic K-theory and homotopy
Chris Phillips, Simple C*-algebras
Robby Robson, Undergraduate research

August 1994 Meeting in Minneapolis, Minnesota
Associate Secretary: Lesley M. Sibner
Deadline for organizers: Expired
Deadline for consideration: April 26, 1994

Thomas Drucker, History of mathematical logic and theoretical computer science
Dennis M. Roseman, Computer graphics as a research tool in geometry and topology

November 1994 Meeting in Stillwater, Oklahoma
Central Section
Associate Secretary: Andy R. Magid
Deadline for organizers: Expired
Deadline for consideration: July 13, 1994

Ara S. Basmajian and Robert R. Miner, Complex hyperbolic geometry and discrete groups
Edward T. Cline, Representations of algebraic groups
Brian Conrey and William D. Duke, Number theory
Bruce C. Crauder and Zhenbo Qin, Algebraic geometry
Edward G. Dunne and Roger C. Zierau, Geometry and representations of Lie groups
Alan R. Elcrat, Fluid dynamics
Benny D. Evans, The evolving undergraduate mathematics curriculum
Vladimir Ezhov and Alan V. Noell, Several complex variables
Jerry A. Johnson, Technology in the classroom
Mark W. McConnell, Arithmetic groups and topology
Phillip E. Parker, Geometry and geodesics

November 1994 Meeting in Richmond, Virginia
Southeastern Section
Associate Secretary: Robert J. Daverman
Deadline for organizers: February 11, 1994
Deadline for consideration: July 13, 1994
Meetings

Paul S. Bourdon and William T. Ross, Operator on Banach spaces of analytic functions

January 1995 Meeting in San Francisco, California
Associate Secretary: Andy R. Magid
Deadline for organizers: April 2, 1994
Deadline for consideration: September 9, 1994

March 1995 Meeting in Hartford, Connecticut
Eastern Section
Associate Secretary: Lesley M. Sibner
Deadline for organizers: June 3, 1994
Deadline for consideration: To be announced

March 1995 Meeting in Orlando, Florida
Southeastern Section
Associate Secretary: Robert J. Daverman
Deadline for organizers: June 17, 1994
Deadline for consideration: To be announced

Robert C. Brigham and Richard P. Vitray, Combinatorics and graph theory
John R. Cannon, Inverse and ill-posed problems
S. Roy Choudhury, Nonlinear dynamical systems, chaos, and turbulence
S. Roy Choudhury and Lokenath Debnath, Solitons and nonlinear waves
Xin Li and Ram N. Mohapatra, Approximation theory and special functions
Piotr Mikusinski, New trends in generalized functions
Ahmed I. Zayed, Sampling theory, wavelets, and signal processing

March 1995 Meeting in Chicago, Illinois
Central Section
Associate Secretary: Andy R. Magid
Deadline for organizers: June 24, 1994
Deadline for consideration: To be announced

November 1995 Meeting in Kent, Ohio
Central Section
Associate Secretary: Andy R. Magid
Deadline for organizers: February 4, 1995
Deadline for consideration: To be announced

January 1996 Meeting in Orlando, Florida
Associate Secretary: Lance W. Small
Deadline for organizers: April 12, 1995
Deadline for consideration: To be announced

March 1996 Meeting in Iowa City, Iowa
Central Section
Associate Secretary: Andy R. Magid
Deadline for organizers: June 22, 1995
Deadline for consideration: To be announced

Daniel D. Anderson, Commutative ring theory

April 1996 Meeting in Baton Rouge, Louisiana
Southeastern Section
Associate Secretary: Robert J. Daverman
Deadline for organizers: July 19, 1995
Deadline for consideration: To be announced

January 1997 Meeting in San Diego, California
Associate Secretary: Lesley M. Sibner
Deadline for organizers: April 8, 1996
Deadline for consideration: To be announced

Information for Organizers
Potential organizers should refer to the January issue of the Notices for guidelines on organizing a session. Proposals for any of the meetings mentioned in the preceding section should be sent to the cognizant associate secretary by the deadline indicated. No special sessions can be approved too late to provide adequate advance notice to members who wish to participate.

Western Section
Lance W. Small, Associate Secretary
Department of Mathematics
University of California, San Diego
La Jolla, CA 92093
E-mail: g_small@math.ams.org
Telephone: 619-534-3590

Central Section
Andy R. Magid, Associate Secretary
Department of Mathematics
University of Oklahoma
601 Elm PHSC 423
Norman, OK 73019
E-mail: g_magid@math.ams.org
Telephone: 405-325-6711

Eastern Section
Lesley M. Sibner, Associate Secretary
Department of Mathematics
Polytechnic University
Brooklyn, NY 11201-2990
E-mail: g_sibner@math.ams.org
Telephone: 718-260-3505

Southeastern Section
Robert J. Daverman, Associate Secretary
Department of Mathematics
University of Tennessee
Knoxville, TN 37996-1300
E-mail: g_daverman@math.ams.org
Telephone: 615-974-6577

Other Information
General information for speakers and full instructions for submitting abstracts, as well as information on site selection for Sectional Meetings, can be found in the January issue of the Notices.
Joint Summer Research Conferences in the Mathematical Sciences

Mount Holyoke College, South Hadley, Massachusetts, June 11–July 15, 1994

The 1994 Joint Summer Research Conferences in the Mathematical Sciences will be held at Mount Holyoke College, South Hadley, Massachusetts, from June 11–July 15. It is anticipated that the series of conferences will be supported by grants from the National Science Foundation and other agencies.

There will be six conferences in six different areas of mathematics. The topics and organizers for the conferences were selected by the AMS, the Institute of Mathematical Statistics (IMS), and the Society for Industrial and Applied Mathematics (SIAM) Committee on Joint Summer Research Conferences in the Mathematical Sciences. The selections were based on suggestions made by the members of the committee and individuals submitting proposals. The committee considered it important that the conferences represent diverse areas of mathematical activity, with emphasis on areas currently especially active, and paid careful attention to subjects in which there is important interdisciplinary activity at present.

The Joint Summer Research Conferences are intended to complement the Society’s program of annual Summer Institutes and Summer Seminars, which have a larger attendance and are substantially broader in scope. The conferences are research conferences and are not intended to provide an entree to a field in which a participant has not already worked.

It is expected that funding will be available for a limited number of participants in each conference. Others, in addition to those funded, will be welcome, within the limitations of the facilities of the campus. In the spring a brochure of information will be mailed to all who are requesting to attend the conferences. The brochure will include information on room and board rates, the residence and dining hall facilities, travel, local information, and a Residence Housing Form to request on-campus accommodations. Information on off-campus housing will also be included in the brochure. Participants will be responsible for making their own housing and travel arrangements. Each participant will be required to pay a conference fee.

Those interested in attending one of the conferences should send the following information to the Summer Research Conference Coordinator, Conferences Department, American Mathematical Society, Post Office Box 6887, Providence, RI 02940; fax: 401-455-4004; e-mail: chh@math.ams.org.

Please type or print the following:

1. Title and dates of conference desired.
2. Full name.
3. Mailing address.
4. Telephone number and area code for office and home, e-mail address, fax number.
5. A short paragraph describing your scientific background relevant to the topic of the conference. Also indicate if you are a graduate or undergraduate student, or if you received your Ph.D. on or after 7/1/88.
6. Financial assistance requested; please estimate cost of travel.
7. Indicate if support is not required and if interested in attending even if support is not offered.

The deadline for receipt of requests for information is March 4, 1994. Requests to attend will be forwarded to the Organizing Committee for each conference for consideration after the deadline of March 4. All applicants will receive a formal invitation, Brochure of Information, notification of financial assistance, and a tentative scientific program (if the chair has prepared one in advance; otherwise, programs will be distributed at on-site registration) from the AMS by May 1. Funds available for these conferences are limited and individuals who can obtain support from other sources should do so. The allocation of grant funds is administered by the AMS office, and the logistical planning for the conferences is also done by the AMS. However, it is the responsibility of the chair of the Organizing Committee of each conference to determine the amount of support participants will be awarded. This decision is not made by the AMS. Women and minorities are encouraged to apply and participate in these conferences.

Any questions concerning the scientific portion of the conference should be directed to the chair or any member of the Organizing Committee.

The Joint Summer Research Conferences in the Mathematical Sciences are under the direction of the AMS-IMS-SIAM Committee on Joint Summer Research Conferences in the Mathematical Sciences. The following committee members chose the topics for the 1994 conferences: Fan R. K. Chung, Leonard Evens, Alan F. Karr, Peter W. K. Li, Bart Ng, Stewart B. Priddy, Robert J. Serfling, Michael Shub, William E. Strawderman, and Sue Whitesides.

N.B. Lectures begin on Sunday morning and run through Thursday. Check in for housing begins on Saturday. No lectures are held on Saturday.
Meetings

Please refer to the November issue of the Notices for complete descriptions.

Saturday, June 11, to Friday, June 17
Continuous algorithms and complexity
J. F. Traub (Columbia University), co-chair
J. Renegar (Cornell University), co-chair

Saturday, June 18, to Friday, June 24
Moonshine, the monster, and related topics
Geoffrey Mason (University of California, Santa Cruz), chair
Chongying Dong (University of California, Santa Cruz), co-chair
John McKay (Concordia University), co-chair

Saturday, June 25, to Friday, July 1
Markov chain Monte Carlo methods
Alan Gelfand (University of Connecticut), chair

Saturday, July 2, to Friday, July 8
Periodicity and structured homology theories in homotopy theory
Paul G. Goerss (University of Washington), co-chair
Hal Sadosky (Johns Hopkins University), co-chair
Paul L. Shick (John Carroll University), co-chair

Saturday, July 9, to Friday, July 15
Bergman spaces and the operators that act on them
Stephen D. Fisher (Northwestern University), co-chair
Sheldon Axler (Michigan State University), co-chair
Peter L. Duren (University of Michigan), co-chair

UNIVERSITY LECTURE SERIES

Group Characters, Symmetric Functions, and the Hecke Algebra
David Goldschmidt
Volume 4

The book is made up of lecture notes from a course taught by Goldschmidt at the University of California at Berkeley in 1989. The course was organized in three parts. Part I covers, among other things, Burnside’s Theorem that groups of order $p^aq^b$ are solvable, Frobenius’s Theorem on the existence of Frobenius kernels, and Brauer’s characterization of characters. Part II covers the classical character theory of the symmetric group and includes an algorithm for computing the character table of $S_n$; a construction of the Specht modules; the “determinant form” for the irreducible characters; the hook-length formula of Frame, Robinson, and Thrall; and the Murnaghan-Nakayama formula. Part III covers the ordinary representation theory of the Hecke algebra, the construction of the two-variable Jones polynomial, and a derivation of Ocneanu’s “weights” due to T. A. Springer.

1991 Mathematics Subject Classification: 20, 57
Individual member $42, List price $70, Institutional member $56
To order, please specify ULECT/4NA

All prices subject to change. Free shipment by surface: for air delivery, please add $6.50 per title. Prepayment required. Order from: American Mathematical Society, P.O. Box 5904, Boston, MA 02205-5904, or call toll-free 800-321-4AMS (321-4267) in the U.S. and Canada to charge with VISA or MasterCard. Residents of Canada, please include 7% GST.
1994 Summer Seminar in Applied Mathematics

Dynamical systems and probabilistic methods for nonlinear waves

Mathematical Sciences Research Institute, Berkeley, California, June 20–July 1

The twenty-fourth AMS-SIAM Summer Seminar in Applied Mathematics will be held June 20–July 1, 1994, at the Mathematical Sciences Research Institute in Berkeley, California. The seminar will be sponsored by the American Mathematical Society, the Mathematical Sciences Research Institute, and the Society for Industrial and Applied Mathematics. It is anticipated that the seminar will be partially supported by grants from federal agencies. The proceedings of the seminar will be published by the American Mathematical Society in the Lectures in Applied Mathematics series.

Nonlinear waves provide a rich source of phenomena which are important to both mathematics and science. Scientifically, these include disturbances in the atmosphere and the oceans, the propagation of laser light in nonlinear optics, and waves in plasmas and fluids. Mathematically, nonlinear wave theory has unveiled the soliton: one of the most important discoveries in nonlinear partial differential equations (pde’s) during the last twenty-five years. In addition, results in nonlinear wave theory include rigorous descriptions of the scattering of localized solitary waves, detailed descriptions of the development of singularities for nonlinear pde’s, a thorough understanding of dissipative and dispersive mechanisms for the regularization of these singularities, and numerical observations (with theoretical interpretation) of temporally chaotic behavior in nonlinear dissipative waves.

From a mathematical perspective, many recent results about nonlinear waves belong to a relatively new area—infinite dimensional dynamical systems theory for pde’s. Soliton equations are completely integrable Hamiltonian systems in infinite dimensions. The stability and scattering of solitary waves naturally admit dynamical systems interpretations which play a central role in their resolution. The same can be said of the description of the development and behavior of singularities for nonlinear Schroedinger equations. Dynamical systems theory is central to any study of chaotic dispersive waves.

However, from a scientific perspective, these successes have been restricted to relatively simple situations involving one, a very few, or a regular array of solitary waves. To address issues of greater scientific relevance and complexity, it is likely that probabilistic methods for nonlinear pde’s are required. Nonlinear waves are beginning to provide an excellent testing ground for these methods. Natural questions concern the interaction of many solitary waves (coherent structures) with each other and with a random environment which itself could be fixed or evolving.

More specifically, the organizers note recent mathematical results in the equilibrium statistical mechanics of solitons, in the advection of a passive scalar via a random velocity field, in nonequilibrium statistical theories of both weak and strong turbulence, and in stochastic pde’s such as the randomly forced Burgers and nonlinear Schroedinger equations. Controlled numerical studies are beginning to appear which investigate the coexistence of random and nonlinear effects in waves, and which test the predictions of the more heuristic turbulence theories. These theories and numerical studies directly impact our knowledge of wind-driven waves in the ocean, of chaotic and turbulent behavior in plasmas, of the long-distance propagation of laser pulses in nonlinear fibers, and of idealized models of proteins and DNA, for example.

This research area, bringing probabilistic and dynamical systems methods to bear on pde’s, is very broad. Advances require that modern mathematical theories, together with computational and visualization methods, be developed and applied to appropriate and relevant scientific problems. Probabilistic and dynamical methods pose important technical problems in pde theory and unveil fascinating new phenomena. They constitute an important general area to expose to researchers who are just initiating their own programs.

The organizing committee consists of Percy Deift, Courant Institute for the Mathematical Sciences, New York University; Philip Holmes (co-chair), Cornell University; James M. Hyman, Los Alamos National Laboratories; C. David Levermore, University of Arizona; David W. McLaughlin (co-chair), Princeton University; Y. Sinai, Princeton University; and C. Eugene Wayne, Pennsylvania State University.

Expository series of lectures will be given by senior researchers including Peter S. Constantin, Walter L. Craig, Percy Deift, Charles Doering, Hermann Flaschka, Nancy J. Kopell, Dave Levermore, David W. McLaughlin, Alexander Mielke, Gene Wayne, and Steve Wiggins.

Those interested in attending the seminar should send the following information before March 15, 1994, to AMS-SIAM Summer Seminar Conference Coordinator, American Mathematical Society, P.O. Box 6887, Providence, R.I. 02940; e-mail: d1s@math.ams.org. Please type or print the following:

1. Full name and mailing address;
2. Telephone number and area code for office and home;
3. E-mail address if available;
4. Anticipated arrival and departure dates;
5. Your scientific background relevant to the topic of the seminar; please indicate if you are a student or if you received your Ph.D. on or after 7/1/88;
Meetings

6. Financial assistance requested (please estimate cost of travel); indicate if support is not required and if interested in attending even if support is not offered.

Special encouragement is extended to junior scientists to apply. A special pool of funds expected from federal agencies has been earmarked for this group. Other participants who wish to apply for a grant-in-aid should so indicate; however, funds available for the seminar are very limited, and individuals who can obtain support from other sources should do so. Graduate students who have completed at least one year of graduate school are encouraged to participate.

American Mathematical Society Translations, Series 2

Ordered Sets and Lattices II
Volume 152

This indispensable reference source contains a wealth of information on lattice theory. The book presents a survey of virtually everything published in the fields of partially ordered sets, semilattices, lattices, and Boolean algebras that was reviewed in Referativnyi Zhurnal Matematika from mid-1982 to the end of 1985. Of interest to mathematicians, as well as to philosophers and computer scientists in certain areas, this unique compendium is a must for any mathematical library.

1991 Mathematics Subject Classification: 06; 03, 08
ISBN 0-8218-7501-9, 247 pages (hardcover), November 1992
Individual member $77, List price $128, Institutional member $102
To order, please specify TRANS2/152NA

Singularity Theory and Some Problems of Functional Analysis
Volume 153
S. G. Gindikin, Editor

The papers in this volume include reviews of established areas as well as presentations of recent results in singularity theory. The authors have paid special attention to examples and discussion of results rather than burying the ideas in formalism, notation, and technical details. The aim is to introduce all mathematicians—as well as physicists, engineers, and other consumers of singularity theory—to the world of ideas and methods in this burgeoning area.

1991 Mathematics Subject Classification: 40, 51, 57, 58, 92; 12, 19, 28, 32, 35, 49, 60
ISBN 0-8218-7502-7, 199 pages (hardcover), November 1992
Individual member $61, List price $101, Institutional member $81
To order, please specify TRANS2/153NA

All prices subject to change. Free shipment by surface; for air delivery, please add $6.50 per title. Prepayment required. Order from: American Mathematical Society, P.O. Box 5904, Boston, MA 02266-5904, or call toll free 800-321-4AMS (321-4267) in the U.S. and Canada to charge with VISA or MasterCard. Residents of Canada, please include 7% GST.

FEBRUARY 1994, VOLUME 41, NUMBER 2
Symposium on Quantization and Nonlinear Wave Equations

Massachusetts Institute of Technology, Cambridge, Massachusetts
June 7–11, 1994

With the support of a fund established by Dr. and Mrs. Carroll V. Newsom in honor of the memory of John von Neumann and anticipated support from the National Science Foundation, a symposium on Quantization and nonlinear wave equations will take place at the Massachusetts Institute of Technology, Cambridge, Massachusetts, from Tuesday through Saturday, June 7–11, 1994.

The topic was selected by the AMS Committee on Summer Institutes and Special Symposia, whose members at the time of selection were William Browder, Princeton University; Donald L. Burkholder, University of Illinois; Lawrence Craig Evans, University of California, Berkeley; Melvin Hochster, University of Michigan; Nicholas Katz, Princeton University; Brian Parshall (chair), University of Virginia; Jean-François Treves, Rutgers University; and Edward Witten, Institute for Advanced Study. Proceedings will be published by the American Mathematical Society.

The Organizing Committee for the symposium includes William Arveson, University of California, Berkeley; Robert Blattner, University of California, Los Angeles; Haim Brezis, Rutgers University and University of Paris (co-chair); Thomas Branson, University of Iowa; and Irving Segal, Massachusetts Institute of Technology (co-chair).

The symposium will review, report recent progress in, and survey possible future directions in the field of physical mathematics that was at the heart of von Neumann's motivation and some of his most seminal contributions. Session topics include the global theory of classical nonlinear wave equations and its differential geometric and general relativistic aspects; the mathematical theory of quantum fields and its algebraic and constructive aspects; operator algebra, groups of automorphisms, and new directions in quantum mechanics; and symplectic quantization and group representations.

A list of prospective speakers includes William Arveson, University of California, Berkeley; Robert Blattner, University of California, Los Angeles; Thomas Branson, University of Iowa; Haim Brezis, Rutgers University and University of Paris; Yvonne Choquet-Bruhat, University of Paris; Alain Connes, College de France and Institute des Hautes Etudes Scientifiques; Ludwig Faddeev, Steklov Mathematical Institute; Charles Fefferman, Princeton University; Jürg Frohlich, Eidgenosse Technische Hochschule; Izrail Gelfand, Rutgers University; Leonard Gross, Cornell University; Roger Howe, Yale University; Arthur Jaffe, Harvard University; Palle Jorgensen, University of Iowa; Sergiu Klainerman, Princeton University; David Kazhdan, Harvard University; Peter Lax, Courant Institute of Mathematical Sciences; Robert Power, University of Pennsylvania; Richard Schoen, Stanford University; Irving Segal, Massachusetts Institute of Technology; Walter Strauss, Brown University; Michelle Vergne, Centre de Recherche Scientifique; Arthur Wightman, Princeton University; and Zhengfang Zhou, Michigan State University.

A list of prospective panel discussion leaders includes Victor Guillemin, Massachusetts Institute of Technology; Cathleen S. Morawetz, Courant Institute of Mathematical Sciences; P. L. Lions, University of Paris; and David Vogan, Massachusetts Institute of Technology.

One afternoon will be free of scheduled talks in order to facilitate ad hoc scientific discussions or visits to sites of general interest in the greater Boston area.

Accommodations will be in MIT dormitories located on the Charles River a short walk from the meeting area. Rooms of several sizes and types will be available, both with and without a meal plan. MIT is conveniently reached by subway or taxi from the rail terminus, South Station, or Logan Airport in a matter of minutes. MIT adjoins Kendall Square, which is well supplied with hotels and restaurants. The meeting area will be close to the Institute Science Library and nearby discussion/seminar rooms will be available.

In the spring a brochure of information will be mailed to all who are requesting to attend the symposium. The brochure will include information on room and board rates, the residence and dining hall facilities, travel, local information, and a Residence Housing Form to request on-campus accommodations. Information on off-campus housing will also be included in the brochure. Participants will be responsible for making their own housing and travel arrangements. It is expected that funding will be available for a limited number of participants. Limited support is expected to be available for graduate students. A social fee of $15 will be required.

Those interested in attending the symposium should send the following information to the Symposium Conference Coordinator, Meetings and Conferences Department, American Mathematical Society, Post Office Box 6887, Providence, RI 02940; fax: 401-455-4004; e-mail: wsd@math.ams.org.

Please type or print the following:
1. Full name.
2. Mailing address.
3. Telephone number and area code for office and home, e-mail address, fax number.
4. A short paragraph describing your scientific background relevant to the topic of the conference.
5. Financial assistance requested; please estimate cost of travel.
Meetings

6. Indicate if support is not required and if interested in attending even if support is not offered.
7. Indicate if graduate student, undergraduate student, or Ph.D. received on or after 7/1/88.

The deadline for receipt of requests for information is March 1, 1994. Requests to attend will be forwarded to the Organizing Committee for consideration after the deadline of March 1. All applicants will receive a formal invitation, Brochure of Information, notification of financial assistance, and a tentative scientific program (if the co-chairs have prepared one in advance; otherwise, programs will be distributed on-site) from the AMS by May 1, 1994. Funds available for the symposium are limited, and individuals who can obtain support from other sources should do so. The allocation of grant funds is administered by the AMS office, and the logistical planning for the conferences is also done by the AMS. However, it is the responsibility of the co-chairs of the Organizing Committee to determine the amount of support participants will be awarded. Women and minorities are encouraged to apply and participate in this symposium.

Any questions concerning the scientific portion of the symposium should be directed to Irving Segal, MIT, Room 2-244, Cambridge, MA 02139; telephone: 617-253-4985; e-mail: ies@math.mit.edu.

TRANSLATIONS OF MATHEMATICAL MONOGRAPHS

Functions on Manifolds
Algebraic and Topological Aspects
V. V. Sharko
Volume 131

This monograph covers in a unified manner new results on smooth functions on manifolds. A major topic is Morse and Bott functions with a minimal number of singularities on manifolds of dimension greater than five. Sharko computes obstructions to deformation of one Morse function into another on a simply connected manifold. In addition, a method is developed for constructing minimal chain complexes and homotopical systems in the sense of Whitehead. This leads to conditions under which Morse functions on non-simply-connected manifolds exist. Sharko also describes new homotopical invariants of manifolds, which are used to substantially improve the Morse inequalities. The conditions guaranteeing the existence of minimal round Morse functions are discussed.

1991 Mathematics Subject Classification: 57, 58
ISBN 0-8218-4578-0, 193 pages (hardcover), November 1993
Individual member $59, List price $98, Institutional member $78
To order, please specify MMONO/131NA

All prices subject to change. Free shipment by surface; for air delivery, please add $6.50 per title. Prepayment required. Order from: American Mathematical Society, P.O. Box 5904, Boston, MA 02205-5904, or call toll free 800-321-4AMS (321-4267) in the U.S. and Canada to charge with VISA or MasterCard. Residents of Canada, please include 7% GST.
Summer Meeting of the Canadian Mathematical Society  
June 11–13, 1994

Tentative Program

The Canadian Mathematical Society (CMS) and the University of Alberta cordially invite mathematicians to the 1994 Summer Meeting of the Society. The entire program will take place in the Central Academic Building of the University of Alberta in Edmonton, the capital of Alberta, from Saturday, June 11, to Monday, June 13, 1994.

Plenary Speakers

Donald A. Dawson, Carleton University, Stochastic partial differential equations and measure-valued processes, Sunday, 1:30 p.m.;

Ronald A. DeVore, University of South Carolina, Columbia, Multivariate approximation theory: Where are we now?, Saturday, 1:30 p.m.;

Nigel Higson, Pennsylvania State University, C*-algebras, K-theory, and group representations, Saturday, 9:00 a.m.;

Peter J. Olver, University of Minnesota, Minneapolis, Differential invariants, Sunday, 9:00 a.m.;

Roger Palmer, Alberta Education, The transition from high school to university, Saturday, 8:00 p.m.; and

Cheryl Praeger, University of Western Australia, Block-transitive designs, Monday, 9:00 a.m.

Jeffery-Williams Lecturer

The Jeffery-Williams Lecture will be given by Donald A. Dawson and is scheduled on Sunday from 1:30 p.m. to 2:30 p.m.

Symposia

Symposia in four domains will take place with session organizers, tentative schedules, and invited speakers as follows:

Multivariate approximation theory, organized by Sherman D. D. Riemenschneider and Rong-Qing Jia, University of Alberta; Saturday afternoon, Sunday and Monday mornings and afternoons. Peter B. Borwein (Simon Fraser), Len Bos (Calgary), Charles K. Chui (Texas A&M), Carl de Boor (Wisconsin), Ronald A. DeVore, Wolfgang Dahmen (RWTH-Aachen), Zeev Ditzian (Alberta), Serge Dubuc (Montréal), Nira Dyn (Tel Aviv), Walter J. Whiteley (York).

The uses of K-theory in operator algebras, organized by John Phillips, University of Victoria; Saturday and Sunday mornings and afternoons. Bruce E. Blackadar (Nebraska), Marius Dadarlat (Purdue), George Elliot (Toronto), David Handelman (Ottawa), Nigel Higson, Huaxin Lin (SUNY-Buffalo), Mikael Rordam (Odense), Hongbin Su (Swansea).

Combinatorics, organized by Katherine Heinrich, Simon Fraser University; Saturday, Sunday, and Monday mornings and afternoons. Hélène Barcelo (Arizona State), Lynn M. Batten (Manitoba), Charles J. Colbourn (Waterloo), Reinhart Diestel (Germany), Luis A. Goddyn (Simon Fraser), Penny Haxell (Waterloo), Joan P. Hutchinson (Macalester College), Maria M. Klawe (UBC), Cheryl Praeger.

Differential geometrical aspects of PDEs, organized by Niky Kamran, McGill University; Saturday, Sunday, and Monday mornings and afternoons. Ian M. Anderson (Utah State), G. Bluman (UBC), Robert B. Gardner (North Carolina), J. Harnad (Concordia), Jacques C. Hurtubise (McGill), M. Kossowski (South Carolina), François Lalonde (UQAM), M. Legare (Alberta), Peter J. Olver, Juha Pohjanieltto (Oregon State), David L. Rod (Calgary), William F. Shadwick (Waterloo).

Education Program

The Mathematics Education Session is being organized by Alvin Baragar, University of Alberta, and features the plenary lecture by Roger Palmer on Saturday at 8:00 p.m. The talk will be preceded by a barbecue; details may be found in the Social Events section below.

The session also will include a panel discussion scheduled for Sunday morning.

Contributed Papers

Contributed papers of fifteen minutes’ duration are invited. Abstracts should be prepared as specified below. To be eligible to present a contributed paper, all abstracts and registration fees must be received in Ottawa before March 15, 1994.

Most of the papers to be presented at the four symposia will be by invitation. However, anyone contributing an abstract for the meeting who feels that his or her paper would be particularly appropriate for one of these symposia should indicate this clearly on the abstract form and submit it by February 15, 1994 in order that it be considered for inclusion.

Those who use the \TeX typesetting system may submit their abstracts by e-mail. Files should include the speaker’s name, affiliation, complete address, title of talk, and the abstract itself. Files may be sent to the abstracts coordinator, clequel@acadvm1.ualberta.ca.

Others should prepare their abstract using the standard CMS form available from the CMS Office in Ottawa or in the January/February CMS Notes. Abstracts should be sent to the Abstracts Coordinator, CMS Executive Office, 577 King Edward, Suite 109, P. O. Box 450, Station A, Ottawa, Ontario, Canada K1N 6N5 so as to arrive by the contributed papers’ deadline of March 15, 1994 or February 15, 1994 (see above).
Social Events

All delegates are invited to a cash bar welcoming reception scheduled on Friday evening from 7:00 p.m. to 9:00 p.m. during evening registration in the Banquet Room on the second floor of Lister Hall Residence.

A banquet will be held at the Empire Ballroom of Hotel Macdonald in downtown Edmonton and is scheduled for Sunday, June 12, at 7:30 p.m. Delegates are invited to meet at the cash bar which will be open from 6:30 p.m. to 7:30 p.m. Tickets are available for CDN$40 each, including all taxes and gratuities, and are included in most registration fee categories. The entree is stuffed cornish game hen with grand marnier glaze; kosher or vegetarian meals are available upon advance request.

A barbecue is being organized in connection with the Education Session and is scheduled for Saturday, June 1, at 6:30 p.m. at the Quadrangle. Tickets are CDN$16 each, including taxes and gratuity. Please note that this event is not included in any of the registration fee categories and must be purchased by all delegates. The entree is sirloin steak or chicken or ribs; kosher, vegetarian, or other special diet meals are available upon advance request.

During the meeting you are invited to have complimentary coffee and chat with colleagues during the scheduled morning and afternoon breaks.

Preregistration

Payment for preregistration may be made by check, VISA, or MasterCard. Although preregistration fees are given in Canadian dollars, delegates may send checks in U.S. dollars by contacting their financial institution for the current exchange rate. A preregistration form is included in the January/February CMS Notes or may be requested from the CMS Executive Office at the address above or by telephone: 613-564-2223 or fax: 613-565-1539.

Registration Fees

(in Canadian dollars)

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*Includes banquet on Sunday night at 7:30 p.m.

The Lister Hall (University Residence): telephone: 403-492-5123; fax: 403-492-7032; single is $24; twin is $34; all rates include continental breakfast.

Accommodations

Blocks of rooms have been reserved at two hotels and at the university residences. The following rates are in effect (in Canadian dollars):

**The Howard Johnson Plaza Hotel:** telephone: 403-423-2450 (collect); fax: 403-425-1783 or 403-426-6090; single/double is $60.

**The Campus Tower Hotel:** telephone: 403-439-6060 or 800-661-6562; fax: 403-492-7032; one bedroom is $65, two bedrooms are $110 (limited number available).

**The Lister Hall (University Residence):** telephone: 403-492-5123; fax: 403-492-7032; single is $24; twin is $34; all rates include continental breakfast.

Travel

Edmonton International Airport (403-890-8322) is located south of the city and is accessible via Highway 2. Airport bus and taxi services are available. Edmonton Municipal Airport (403-492-6641) is located at the northwest edge of the downtown core and is served by taxis and city buses. Air Canada and Continental Airlines have been named the official air carriers. In North America call 1-800-361-7585 directly for Air Canada. Any licensed travel agent may also book an Air Canada flight; instruct the agent to enter event number CV940404 in the tour code box and reference code CMS in the endorsement box.

Acknowledgments

The Scientific Program Committee wishes to extend its thanks to the Natural Sciences and Engineering Research Council (NSERC) for its generous support of the symposia. Other grants have been received from the University of Alberta.

The CMS also wishes to acknowledge the contribution of the following committees in presenting these exciting scientific, educational, and social programs. We also thank those at the host department who have taken time from their regular duties to help out.

**Scientific Programme Committee:** Katherine Heinrich (Simon Fraser); Rong-Qing Jia (Alberta); Niky Kamran (McGill); John Phillips (Victoria); Sherman Riemenschneider (Alberta); Keith Taylor (Saskatchewan), chair; Nicole Tomczak-Jaegermann (Alberta), ex officio; Graham P. Wright (Ottawa), ex officio.

**Education Session:** Alvin Baragar (Alberta).

**Local Arrangements Committee:** Monique L. Bouchard, (CMS), ex officio; Laurent Marcoux (Alberta); René Poliquin (Alberta); Henry Van Roessel (Alberta); Mazi Shirvani (Alberta), chair.
Mathematical Sciences 
Meetings and Conferences

THIS SECTION contains announcements of meetings and conferences of interest to some segment of the mathematical public, including ad hoc, local, or regional meetings, and meetings or symposia devoted to specialized topics, as well as announcements of regularly scheduled meetings of national or international mathematical organizations. A complete listing of meetings of the Society, and of meetings sponsored by the Society, will be found inside the front cover.

AN ANNOUNCEMENT will be published in the Notices if it contains a call for papers and specifies the place, date, subject (when applicable), and the speakers; a second announcement will be published only if there are changes or necessary additional information. Once an announcement has appeared, the event will be briefly noted in each issue until it has been held and a reference will be given in parentheses to the month, year, and page of the issue in which the complete information appeared. Asterisks (*) mark those announcements containing new or revised information.

IN GENERAL, announcements of meetings and conferences held in North America carry only date, title of meeting, place of meeting, names of speakers (or sometimes a general statement on the program), deadlines for abstracts or contributed papers, and source of further information. Meetings held outside the North American area may carry more detailed information. In any case, if there is any application deadline with respect to participation in the meeting, this fact should be noted. All communications on meetings and conferences in the mathematical sciences should be sent to the Editor of the Notices, care of the American Mathematical Society in Providence, or electronically to notices@math.ams.org.

DEADLINES for entries in this section are listed on the inside front cover of each issue. In order to allow participants to arrange their travel plans, organizers of meetings are urged to submit information for these listings early enough to allow them to appear in more than one issue of the Notices prior to the meeting in question. To achieve this, listings should be received in Providence SIX MONTHS prior to the scheduled date of the meeting.

EFFECTIVE with the 1990 volume of the Notices, the complete list of Mathematical Sciences Meetings and Conferences will be published only in the September issue. In all other issues, only meetings and conferences for the twelve-month period following the month of that issue will appear. As new information is received for meetings and conferences that will occur later than the twelve-month period, it will be announced at the end of the listing in the next possible issue. That information will not be repeated until the date of the meeting or conference falls within the twelve-month period.

1994

February 1994
28–March 4. IMA Workshop on Stochastic Networks, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Jan. 1993, p. 64)

March 1994

INVITED SPEAKERS: D.A. Martin (Göhdel Lecture); C. Parsons (Retiring Presidential Address); A. Blass, M. Foreman, M. Ko­jman, E. Schimmerling, and S. Todorcevic (special sessions in set theory); M.L. Bonet, R. Jagadeesan, G. Nadathur, and N. Shankar (computer science and proof theory); J. Baumgartner, J.-Y. Girard, H. Hodes, J. Knight, S. Shapiro, R. Soure, S. Thomas, and L. van den Dries.

INFORMATION: M. Lerman, Math Dept., U. of Connecticut, Storrs, CT 06269-3009; e-mail: mlerman@uconnvm.uconn.edu.


*7–11. Géométrie Algébrique en Liberte, CIRM, Marseille, France.

ORGANIZER: L. Koeblen (U. Paris 6).
INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

7–11. Twenty-fifth Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Florida Atlantic University, Boca Raton, FL. (Sep. 1993, p. 924)
7–25. Workshop on Fluid Mechanics, International Centre for Theoretical Physics, Trieste, Italy. (Jul./Aug. 1993, p. 711)
17–19. Seminar on Stochastic Processes 1994, Texas A&M University, College Station, TX. (Sep. 1993, p. 925)

PROGRAM: The principle goal of this workshop is the interdisciplinary discussion of basic phenomena that arise in plasticity, with emphasis placed on physical background, formulation of mathematical models, and the current state of knowledge about these models. Phenomena included will cover both high and low strain-rates, as well as those occurring at the length scales of polycrystalline continua, single crystals, slip systems based on discrete crystallographic surfaces, or atomic assemblies with moving defects. Invited speakers will lecture on topics of general interest in plasticity. In place of contributed papers, a significant amount of time will be made available for discussions among participants.

INFORMATION: F. Johnson, Center for Nonlinear Analysis, Department of Mathematics, Carnegie Mellon University, Pitts-
Meetings and Conferences


18-19. Southeastern Section, University of Kentucky, Lexington, KY.

Program: The program will consist of six plenary lectures in diverse fields by distinguished speakers to inaugurate the new Ohio State University mathematics tower.


Information: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

18-19. Mathematics for the 21st Century, Ohio State University, Columbus, OH.

Program: The program will consist of six plenary lectures in diverse fields by distinguished speakers to inaugurate the new Ohio State University mathematics tower.


Information: E-mail: conference@math.ohio-state.edu.

April 1994


5-8. Workshop on Proof Theory, Completeness, Metamathematics, University of Technology, Vienna, Austria.

Program: The workshop will try to explore the area between proof theory, computational complexity, and metamathematics. Particular fields of interest include complexity of logics, theories, and proof systems; proof search; proof theory of first-order systems and logics, in particular classical, modal, temporal, and linear logics; proof theoretic and metamathematical investigations of first-order theories, in particular arithmetic and its subsystems; bounded arithmetic.

Invited Speakers: A. Avron, Tel Aviv; M. Baaz, Vienna; A. Berarducci, Pisa; A. Carbone, Paris; V. Danos, Paris; E. Eder, Salzburg; L. Egidi, Torino; G. Faglia, Milano; G. Gottlob, Vienna; P. Hajek, Prague; J.-P. Joinet, Paris; J. Krajicek, Prague; A. Leitsch, Vienna; V. Orevkov, St. Petersburg; M. Parigot, Paris; P. Pudlak, Prague; P. Wojtylak, Katowice.

Information: Kurt Goedel Society, Institut fuer Computersprachen E185/2, Technische Universitaet Wien, Resselgasse 3/1, A-1040 Vienna, Austria; tel.: (+43 1) 588 01, ext. 4088; fax: (+43 1) 504 1589; e-mail: zacho@logic.tuwien.ac.at.


* 7-8. The First Magnus Lectures. Courant Institute of Mathematical Sciences (NYU) and Polytechnic University, NY.
Meetings and Conferences

TITLES OF TALKS: DeRham theory: a retrospective on the integral geometry of knots. INvITED SPEAKER: R. Bott, Harvard University.

INFORMATION: K. Kuiken (Magnus Lectures), Polytechnic Univ., Six MetroTech Center, Brooklyn, NY 11201; 718-260-3850; fax: 718-260-3136; e-mail: kuiken@vm.poly.edu.


8-10. Eastern Section, Polytechnic University, Brooklyn, NY.

INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.


11-22. Spring School and Workshop on String Theory, Gauge Theory, and Quantum Gravity, Trieste, Italy. (Jan. 1994, p. 52)

12. 1994 Science and Technology Symposium “Motion, Control, and Geometry”, Washington, DC.

PROGRAM: The symposium focuses on control theory as a fundamental aspect of motion generation in many emerging areas. Those areas include microsurgery (for example, involving microrobots or "snakes" capable of locomotion in confined spaces such as an intestinal tract), spacecraft positioning, biological and robotic movement, motor miniaturization, and motion engineering (for instance, via coupled-oscillator pattern generation).


INFORMATION: Board on Mathematical Sciences, National Research Council, NAS 315, 2101 Constitution Ave., NW, Washington, DC 20418-0001; tel: 202-334-2421; fax: 202-334-1597; e-mail: bms@nas.edu.


17-22. International Conference on New Trends in Computer Science I (NETCOMS I), University of Ibadan, Nigeria. (Please note date change from Nov. 1992, p. 1121)


PROGRAM: Topics will include: logic, proof, specification, and semantics of programs and languages; theories and models of concurrency; constructive logic, category theory, and type theory; software specification, manipulation, and verification.


INFORMATION: By e-mail: tacs94@ito.ecei.tohoku.ac.jp, and the full text of the announcement is available by anonymous ftp from theory.stanford.edu in the directory pub/jcm.


24-28. First World Congress on Computational Medicine and Public Health, University of Texas Center for High Performance Computing, Austin, TX. (Nov. 1993, p. 1255)


25-30. Points Paraboldiques et Leur Deploration en Dynamique Reelle, Complexe et en groupes Kleinienes, CIRM, Marseille, France.


INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

26. Second Annual Workshop on I/O Parallel Computer Systems (to be held in conjunction with the International Parallel Processing Symposium-IPPS '94), Cancun, Mexico. (Dec. 1993, p. 1447)

26-30. International Conference on Logic and Algebra Dedicated to Roberto Magari on his 60th Birthday, Pontignano (Siena), Italy. (Jan. 1994, p. 52)

29-May 1. Fourth Midwest Geometry Conference, University of Iowa, Iowa City, IA. (Jan. 1994, p. 52)

May 1994


2-6. IMA Workshop on Image Models (and Their Speech Model Cousins), Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Jan. 1993, p. 64)


2-6. Variété et Contrôle, CIRM, Marseille, France.


INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

2-6. Wavelet Analysis as a Tool for Geometric Synthesis and Analysis, University of Minnesota, Minneapolis, MN. (Nov. 1993, p. 1255)


3-10. Spring College on Quantum Phases, Trieste, Italy. (Jan. 1994, p. 53)


PROGRAM: This year the Festival will center on the areas of geometric group theory.
Meetings and Conferences

and topology of manifolds. There will be seven or eight 60-minute lectures and much opportunity for stimulating conversation.

**INFORMATION:** Topology Festival Committee, Dept. of Math., Cornell U., Ithaca, NY 14853; marshall@math.cornell.edu.

5–8. **MER Network Workshop,** University of Texas at Austin, Austin, Texas.

**INFORMATION:** W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.


**PROGRAM:** There will be a joint ASL/APA Symposium on Category Theory in Logic Foundations of Mathematics.

**INVITED SPEAKERS:** W.F. Lawvere, P. Freyd, and V. Pratt.

**CALL FOR PAPERS:** Abstracts of contributed papers from ASL members should be sent by March 1, 1994, to the address below.

**INFORMATION:** C. McLarty, Dept. of Philosophy, Case Western Reserve U., Cleveland, OH 44106; e-mail: cmx7@po.cwru.edu.


12–14. **Colloquium Logicum—Logic in Mathematics, Philosophy, and Informatics,** Berlin, Germany.

**ORGANIZERS:** German Union for Mathematical Logic and Foundational Research (DVMLG) and logicians from the Humboldt U. of Berlin.

**INFORMATION:** H. Wolter, Humboldt University, FB Mathematik, PSF 1297, 10099 Berlin, Germany; e-mail: hwolter@mathematik.hu-berlin.de.


**INFORMATION:** Organizers, J.C. McConnell and C. Robson, School of Mathematics, University of Leeds, Leeds LS2 9JT; tel.: 532-335144; electronic mail: pmt6jcr@cms1.leeds.ac.uk.


**ORGANIZER:** M. Chardin (Ecole Polytechnique).

**INFORMATION:** A. Zeller-Meier, Centre International de Recontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

16–20. **IMA Workshop on Stochastic Models in Geosystems,** Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Jan. 1993, p. 64)


*16–26. **NATO-Advanced Study Institute on Recent Developments in Approximation Theory, Waves, and Applications, Maratea, Italy.**

**INVITED SPEAKERS:** Cheney, Chui, Deutsch, Micchelli.

**INFORMATION:** S.P. Singh, Dept. of Mathematics, Memorial University, St. John’s, NF; Canada, A1C 5S7; tel: 709-737-8795; fax: 709-737-3010; e-mail: spSingh@kean.uccs.mun.ca. Partial financial support is available.

16–27. **Workshop on Commutative Algebra and its Relation to Combinatorics and Computer Algebra,** International Centre for Theoretical Physics, Trieste, Italy. (Jul./Aug. 1993, p. 712)


*22–25. **24th International Symposium for Multiple-Valued Logic,** Boston, MA.

**INFORMATION:** D. Simovici, U. of Mass. at Boston, Dept. of Math. and Computer Science, Boston, MA 02125; e-mail: dsim@cs.umb.edu.

22–27. **Nonlinear Analysis, Function Spaces, and Applications,** Prague, Czech Republic. (Sep. 1993, p. 926)


23–25. **Sixteenth Symposium on Theory of Computing (STOC),** Montreal, Canada. (September 1993, p. 926)


23–27. **Elliptic and Parabolic Methods in Geometry,** University of Minnesota, Minneapolis, MN. (Nov. 1993, p. 1255)

23–27. **Géométrie Algébrique,** Marseille, France. (Jan. 1994, p. 53)


**SCIENTIFIC COORDINATORS:** T. Ruggeri (U. di Bologna) and T.P. Liu (Stanford U.).

**INVITED SPEAKERS:** G. Boillat (U. de Clermont-Ferrand), P. Colella (U.C. Berkeley), P. Lax (NYU), and T.P. Liu (Stanford U.).

**INFORMATION:** CIME, c/o Dipartimento di Matematica “U. Dini,” viale Morgagni 67/A, 50134 Firenze, Italy; tel. and fax: +39-55-434975; cime@vm.idg.fi.cnr.it.

24–27. **Conference on Hermann G. Graßmann** (1809–1877), Isle of Rügen, Germany. (September 1992, p. 775)


26–29. **ICANN ’94—International Conference on Artificial Neural Networks,** Sorrento Congress Center, near Naples, Italy. (Jul./Aug. 1993, p. 712)


*30–June 3. **Equations aux Dérivées Partielles Stochastiques,** CIRM, Marseille, France.
Meetings and Conferences

30–June 3. International Congress on Women Mathematicians, Moscow, Russia. (Jan. 1994, p. 54)
30–June 4. Problemes en Homotopie Rationelle, Marseille, France. (Jan. 1994, p. 54)
31–June 3. IMA Minisymposium on Phase Transitions in Catalytic Surface Reaction Models, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Jan. 1993, p. 64)

June 1994

3–4. Praha-Chemnitz-Torun Algebra Conference, Charles University, Faculty of Mathematics and Physics, Prague, Czech Republic. (Jan. 1994, p. 54)
6–10. Formes Quadratiques et Groupes Algebriques Lineaires, Marseille, France. (Jan. 1994, p. 54)
7–11. AMS Symposium in Research Mathematics on Quantization and Nonlinear Wave Equations, Massachusetts Institute of Technology, Cambridge, MA.


PROGRAM: There will be a special session on the History of Mathematics in North America (since 1700).

INFORMATION: C. Fraser, Institute for the History and Philosophy of Science and Technology, Victoria College, University of Toronto, Toronto, Ontario M5S 1K7, Canada; cfraser@pas.utoronto.ca.


*13–17. Advanced Topics in Applied Mathematics and Theoretical Physics, CIRM, Marseille, France.

ORGANIZER: D. Testard (CPT, CNRS Marseille).

INFORMATION: A. Zeller-Meier, Centre International de Reccontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

*13–18. International Conference on Logic Planning, Santa Margherita Ligure, Italy.

INFORMATION: By e-mail: martelli@disi.unige.it or phh@es.brown.edu.

*13–22. Dynamical Systems, Villa La Quercia, Montecatini Terme (PT).

SCIENTIFIC COORDINATOR: R. Johnson (U. di Firenze).


INFORMATION: CIME, c/o Dipartimento di Matematica “U. Dini,” viale Morgagni 67/A, 50134 Firenze, Italy; tel. and fax: +39-55-434975; cime@vm.idg.f. cnr.it.


Summer 1994. Summer Regional Centers–TRANSIT, Ohio State University, Columbus, OH. (Oct. 1992, p. 951)
13–17. IMA Workshop on Classical & Modern Branching Processes, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Jan. 1993, p. 64)
13–18. Thirty Years after Sarkovskii’s Theorem—New Perspectives, Murcia, Spain. (Dec. 1993, p. 1449)
16–18. Western Section, University of Oregon, Eugene, Oregon.

INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

*17–18. Conference in Honor of L.D. Berkovitz, Purdue University, West Lafayette, IN.

PROGRAM: The purpose of the conference is to survey, on the occasion of his 70th birthday, L.D. Berkovitz’s work in differential games, control theory, and variational problems.


18–19. IMS Workshop on Directions in Sequential Analysis, Chapel Hill, NC. (Jan. 1994, p. 55)

*19–21. Fourth International Workshop on Meta-programming in Logic (META ’94), Pisa, Italy.

CONFERENCE TOPICS: topics include: foundations of meta-programming; design and implementation of language facilities for meta-programming; meta-programming for knowledge representation, meta-programming, non-monotonic and modal logics; applications of meta-programming.

INFORMATION: meta94@di.unipi.it.

20–24. Probabilités Quantiques, CIRM, Marseille, France. (Jan. 1993, p. 64)
20–24. IMA Workshop on Mathematics in Manufacturing Logistics, Institute for Mathematics and its Applications, University of Min-
Meetings and Conferences

July 1994


*4–8. Arrangements d’Hyperplans, CIRM, Marseille, France.

Florian Klein, University of Pisa and C. Ciliberto (U. di Roma Tor Vergata).


Information: CIME, c/o Dipartimento di Matematica “U. Dini,” viale Morgagni 67/A, 50134 Firenze, Italy; tel. and fax: +39-55-434975; cine@unifi.it


Program: The conference will coordinate three meetings on the following topics: Future Directions in Affine Differential Geometry, General Theory of Submanifolds, and Pure and Applied Differential Geometry. These meetings will be dedicated to K. Nomizu's 70th birthday, which will be celebrated on the first day, July 9. Lectures on his scientific work will be given by Peter Dombrowski (Universität zu Köln) and Udo Simon (Technische Universität Berlin).

Call for Papers: Authors are invited to submit a title and abstract for a short (20-minute) lecture on a topic in pure or applied differential geometry, in particular on the geometry of submanifolds, affine differential geometry, applications of geometry in engineering (robotics, computer vision, ...), physiology (human vision, ...), medicine, ....

Information: F. Dillen, e-mail: fgaba010@cc1.kuleuven.ac.be, L. Verstraeten, e-mail: fgaba06@cc1.kuleuven.ac.be, Katholieke Universiteit Leuven, Departement
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**Program:** The scientific program will consist of invited lectures and short contributions, which will be selected from submitted papers on the following topics: analysis, logic and foundations, nonstandard analysis, computer science, general topology, and set theory.

**Information:** V. Kanovei, e-mail: pankek@compnet.asu.au; or from the local organizer, V. Molchanov, Soussin Foundation, Michurina 92, Saratov 410071 Russia, fax: +845-2-240446, electronic mail: addressed to V. Molchanov postmaster@snct.saratov.su.

10–30. The Park City Institute for Advanced Study Mathematics Institute, Park City, Utah. (Jan. 1994, p. 56)

*11–14. First International Conference on Temporal Logic, Gustav Stresemann Institut, Bonn, Germany.

**Program:** ICTL attempts to create bridges between the various communities working in temporal logic.

**Conference Topics:** Topics include: pure temporal logic, specification and verification, temporal aspects in AI, modeling tense and aspect in natural language, temporal databases, temporal theorem proving, tools, planning and change, and temporal logic programming.


**Invited Speakers:** J. Allen, J. van Bentham, H. Kamp, and A. Pnueli.

**Information:** Program Chairman D. M. Gabbay, Imperial College of Science, Technology, and Medicine, Dept. of Computing, Huxley Blvd., 180 Queen’s Gate, London SW7 2AZ, England; tel: +44-71-225-8447; fax: +44-71-581-8024; e-mail: dg@doc.ic.ac.uk.


**Organizer:** M. Diener (U. Nice).

**Information:** A. Zeller-Meier, Centre International de Rencontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

11–15. Fourteenth IMACS World Congress on Computational and Applied Mathematics, Georgia Institute of Technology, Atlanta, GA. (Oct. 1992, p. 951)


11–22. SMS-NATO ASI: Topological Methods in Differential Equations and Inclusions, Université de Montréal, Montréal, Canada. (Dec. 1993, p. 1451)


14–18. LFCS’94: Logic at St. Petersburg, a Symposium on Logical Foundations of Computer Science, St. Petersburg, Russia. (Jul./Aug. 1993, p. 714)

*16–21. Fifth International Conference on Logic Programming and Automated Reasoning (LPAR ’94), Kiev, Ukraine.

**Conference Topics:** All areas of logic programming and automated reasoning, including (but not limited to): analysis, synthesis and verification; applications; classical and nonclassical logics; constraints; constructive theorem proving; deductive databases; functions and equations; higher-order and meta-programming; implementation and architectures; inductive theorem proving; logical frameworks; parallelism and concurrency; proof theory and semantics; rewriting; theorem proving and symbolic computation; types and type theory; and unification.


**Information:** Program Chairman F. Pfenning/LPAR ’94, Dept. of Computer Science, Carnegie Mellon U., Pittsburgh, PA 15213-3891; tel: 412-268-6343; e-mail: lparg@cc.cmu.edu.

17–23. Conférence Internationale de Topologie, CIRM, Marseille, France. (Jan. 1993, p. 64)


*18–22. CIMNS International Colloquium on Nonstandard Mathematics in Memory of Abraham Robinson, Universities of Aveiro and Beira Interior, Portugal.


**Organizing Committee:** A. F. Oliveira, V. Neves, J.S. Pinto.


**Call for Papers:** A detailed abstract (not a full paper) should be received on or before May 31, 1994, at the address below.

**Information:** J.S. Pinto, Dep. Matematica, Univ. Aveiro, 3800 Aveiro, Portugal; fax: 351-75-382014; e-mail: jaspinto@ua.pt.

*18–22. Knots and 3-manifolds, CIRM, Lum­iny, Marseille.

**Conference Topics:** Classical knot theory, presentation of 3-manifolds, knots and singularities; polynomial invariants, Vas­siliev’s invariant, T.Q.F.T., Casson’s invariant; combinatorial methods; and applications to natural and physical sciences.

**Organizers:** M. Boileau (Toulouse), C. Lescop (Grenoble), K. Millett (US), and M. Domergue and Y. Mathieu (Marseille, interlocuteurs au CIRM).

**Information:** A. Zeller-Meier, Centre International de Recontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

18–22. Sixth International Conference on Fibonacci Numbers and Their Applications, Washington State University, Pullman, WA. (Jul./Aug. 1993, p. 714)

18–22. Conference Internationale de Topologie, Marseille, France. (Jan. 1994, p. 56)


*21–30. 1994 ASL, European Summer Meet­ing (Logic Colloquium ’94), Universite d’Auvergne, Clermont-Ferrand, France.

**Organizers:** Laboratoire de Logique, Al­gorithmique et Informatique of the Universite d’Auvergne, Clermont-Ferrand (LLAIC).

**Program:** The first three days (July 21–
Meetings and Conferences

23) will be devoted to the history of logic and application of modal logic to computer science. The second part (July 25–30) will be devoted to set theory, model theory, recursivity and algorithms, proof theory and models of arithmetics, and finite models and complexity.

CALL FOR PAPERS: Contributed papers are invited from all areas of logic. Abstracts from ASL members are published in the Journal of Symbolic Logic as part of the meeting report. Abstracts should be double-spaced and not more than one page long (about 300 words). They should be sent by March 30, 1994, to the Chair of the Program Committee, D. Richard, LLAIC1 - UIT Department Informatique, BP 86-63172 Aubiere Cedex, France; tel: (33) 73-40-76-05; fax: (33) 73-40-77-33; e-mail: richard@lalica0

cfdvax.univ-bpclermont.fr.

INFORMATION: C. Jallat, meeting secretary, LLAIC1-UIT Department Informatique, BP 86-63172 Aubiere Cedex, France.


27–August 1. International Conference on Commutative Algebra (A Satellite Conference of ICM 94, Zürich), Universität Os nabrück, Standort Vechta, Germany. (Dec. 1993, p. 1451)


*31–August 4. LATEX Users Group Annual Meeting, University of California, Santa Barbara, CA

INFORMATION: Lisa Ward, LATEX Users Group, P.O. Box 869, Santa Barbara, CA 93102; tel: 805-963-1338; fax: 805-963-8358.


August 1994

1–5. Third World Congress on Computational Mechanics (WCCM III), Chiba, Japan. (May/June 1992, p. 497)

1–19. IMA Course on Mathematical Modelling for Teachers, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN. (Dec. 1993, p. 1451)


14–27. NATO Advanced Study Institute on "Finite and Locally Finite Groups", Bosphorous University, Istanbul, Turkey. (Nov. 1993, p. 1257)

15–17. Mathfest, University of Minnesota, Minneapolis, MN (including the summer meetings of the AMS, AWM, MAA, and PME).

INFORMATION: H. Daly, AMS, P.O. Box 6887, Providence, RI 02940.


PROGRAM: The Nizhny Novgorod State University, Radiophysics Research Institute, and the High Technology Incubation Center plan to organize a series of international conferences on “Algorithms in fundamental mathematics’. The scientific program of these conferences includes the methods of construction and the investiga­tions of the complexity and efficiency of algorithms in the various branches of fundamental mathematics.


CONFERENCE TOPICS: Algorithms in algebra and analysis, algorithms in geometry and topology, algorithms in combinatorics, algorithmic foundations of computer science, the theoretical foundations of design of the computer systems for fundamental mathematics.

REGISTRATION FEE: $600 for foreign participants and $300 for accompanying persons.

INFORMATION: M.A. Antonets, Radiophysical Research Institute (NIRFI), Bolshaya Pecherskaya str., 25, Nizhny Novgorod, 603600, Russia; fax: 7-8312369902; e-mail: anton@nirfi.sandy.nov.ru.


CONFERENCE TOPICS: Fluid dynamics, porous media flows, reactive flow problems, structural mechanics.


INVITED SPEAKERS: I. Babuska (US), E. Dick (Belgium), R. Ewing (US), R. Hoppe (FRG), G.C. Hsiao (US), W. Jäger (FRG), C. Johnson (Sweden), R. Jeltsch (Switzerland), J. Maas (FRG), M. Marion (France), J.C. Nedelec (France), J. Pitkäranta (Finland), V. Rikkind (Russia), E. Suli (Great Britain), G. Winnecke (FRG), M. Wheeler
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(US), and G. Wittum (FRG).

CALL FOR PAPERS: The program of the conference will include invited 50-minute lectures and 20-minute communications. Please indicate your intention to give a communication by sending a 15-line abstract (necessary for acceptance of your communication).

INFORMATION: M. Feistauer, Fac. of Math. and Physics, Charles Univ. Prague, Sokolovska 83, 186 00 Praha 8, Czech Republic; tel: +42-2-24-81-08-51, +42-2-23-10-464; fax: +42-2-23-10-464; e-mail mfeistau@karlin.mff.cuni.cz.


INFORMATION: The meeting is convened by P. Tichy, Dept. of Philosophy, U. of Otago, Dunedin, New Zealand.


* 29-September 2. L’arithmetique des Courbes de Genre Deux., CIRM, Marseille, France.

ORGANIZER: J. Boixall (U. de Caen).

INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

September 1994


5-9. IX Brazilian Meeting of Topology, Universidade Federal Fluminense, Instituto de Matematica, Niteroi, Rio de Janeiro, Brazil. (Jan. 1994, p. 57)

* 5-10. Analyse Numerique des Polynomes Orthogonaux, CIRM, Marseille, France.

ORGANIZER: C. Brezinski (U. de Lille).

INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.


* 7-9. IMA Tutorial on Computational Wave Propagation, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN.

INFORMATION: Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St., SE, Minneapolis, MN 55455.


* 12-16. Geometrie Algebrique et Analyse Reelle, CIRM, Marseille, France.

ORGANIZERS: F.P. Francoise (U. de Paris 6) and D. Trotman (U. of Provence).

INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.


CONFERENCE TOPICS: Semantics of algebraic and logic programming, integration of functional and logic programming, term rewriting, narrowing, resolution, constrained logic programming and constrained theorem proving, concurrent features in algebraic and logic programming languages, higher order features in algebraic and logic programming languages, and implementation issues (with possible system demonstrations).

CALL FOR PAPERS: Five copies by February 28 to M. Rodriguez-Artalejo, ALP ’94 Co-chair, Departamento de Informatica y Automatica UCM, Facultad de Matematicas, Avenida Complutense s/n, E28040 Madrid, Spain; tel: +34-1-3-94-45-12; fax: +34-1-3-94-46-07; e-mail mario@dia.ucm.es. Maximum 15 pages (5,000 words).

INFORMATION: E-mail: plilp-alp-info@dia.fi.upm.es.


* 19-23. IMA Workshop on Computational Wave Propagation, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN.

INFORMATION: Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St., SE, Minneapolis, MN 55455.

19-23. 3eme Atelier International de Theorie des Ensembles, CIRM, Marseille, France. (Apr. 1993, p. 416)

INFORMATION: A. Zeller-Meier, Centre International de Recontres Mathematiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.


* 26-29. Second International Conference on Theorem Provers in Circuit Design: Theory, Practice, and Experience, Bad Herrenalb (Blackforest), Germany.

PROGRAM: TCPC provides a forum for discussing the role of theorem provers in the design of digital systems.


INFORMATION: R. Kumar, TCPC Conference chair, Forschungszentrum Informatik, Dept. - ACID, Haid-und-Neu St., 76131 Karlsruhe, Germany; tel: +49-721-9654-419; fax: +49-721-9654-459; e-mail: kumar@fzi.de.

* 26-30. Annual Conference of the European Association for Computer Science Logic (CSL ’94), Kazimierz, Poland.

PROGRAM: Intended for computer scientists
Meetings and Conferences

whose research activities involve logic, as well as for logicians working in areas related to computer science.

**Program Committee:** E. Borger, M. Dezani, N. Jones, P. Kolaitis, J. Krajíček, J.-L. Krivine, L. Pacholski, A. Pitts, A. Razborov, and J. Tiuryn.

**Call for Papers:** Six copies of an extended abstract in English (up to five pages) to the program committee chairman, arriving no later than May 16, 1994.

**Information:** Program Chair, J. Tiuryn (CSL ’94), Institute of Informatics, Warsaw U., ul. Banacha 2, 02-097 Warsaw, Poland; fax: +48-2-6583164; e-mail: cs194@mimuw.edu.pl.

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**October 1994**


*3–7. **Groupes Finis,** CIRM, Marseille, France.

**Organizer:** M. Cabanes (DMI. ENS, Paris).

**Information:** A. Zeller-Meier, Centre International de Recontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.


24–November 11. **Fourth Autumn Course on Mathematical Ecology,** Trieste, Italy. (Jan. 1994, p. 58)

28–30. **Central Section.** Oklahoma State University, Stillwater, Oklahoma.

**Information:** W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

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**November 1994**

2–4. **Mathématique Informatique,** CIRM, Marseille, France.

**Organizer:** MM. Champanauna, Neraud (U. de Rouen).

**Information:** A. Zeller-Meier, Centre International de Recontres Mathématiques, Case 916, 70, Route Léon-LaChamp, 13288 Marseille Cedex 9; tel: 91.83.30.02.

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**December 1994**


Meetings and Conferences

March 1995

4-5. Eastern Section, Hartford, Connecticut.
INFORMATION: W.S. Drady, American Mathematical Society, P.O. Box 6887, Providence, RI 02940.

17-18. Southeastern Section, Orlando, Florida.
INFORMATION: W.S. Drady, American Mathematical Society, P.O. Box 6887, Providence, RI 02940.

24-25. Central Section, DePaul University, Chicago, IL.
INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

The following new announcements will not be repeated until the criteria in the last paragraph in the box at the beginning of this section are met.

May 1995

* 29-June 1. International Conference on Mathematical Modelling, Universiti Brunei Darussalam, Brunei Darussalam.

PROGRAM: The conference will address various physical, biological, engineering, and social systems. Models for specific situations will be presented at the conference. Invited and plenary lectures will present the state of the art of mathematical modelling in some of the main areas with particular reference to the problems of developing nations and of Brunei Darussalam.

CALL FOR PAPERS: Research papers developing mathematical, statistical, and computational models including identification, estimation, and control problems are invited for oral/poster presentation. Particularly encouraged are papers relating to coastal and primary resources, mathematical biosciences, and ecology and pollution, since these areas are of particular interest to Brunei Darussalam. Abstracts are due by March 31, 1994.

INFORMATION: The Organizing Secretary, International Conference on Mathematical Modelling, Dept. of Math., Universiti Brunei Darussalam, Gadong 3186, Negara Brunei Darussalam.

October 1995

7-8. Eastern Section, Northeastern University, Boston, Massachusetts.
INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

November 1995

3-4. Central Section, Kent State University, Kent, Ohio.
INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

17-18. Southeastern Section, University of North Carolina, Greensboro, NC.
INFORMATION: W.S. Drady, AMS P.O. Box 6887, Providence, RI 02940.

January 1996

10-13. Joint Mathematics Meetings, Orlando, Florida (including the annual meetings of the AMS, AWM, MAA, and NAM).
INFORMATION: H. Daly, AMS, P.O. Box 6887, Providence, RI 02940.

March 1996

22-23. Central Section, University of Iowa, Iowa City, Iowa.
INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

April 1996

19-21. Southeastern Section, Baton Rouge, Louisiana.
INFORMATION: W.S. Drady, American Mathematical Society, P.O. Box 6887, Providence, RI 02940.

November 1996

1-2. Central Section, University of Missouri at Columbia, Columbia, Missouri.
INFORMATION: W. Drady, AMS, P.O. Box 6887, Providence, RI 02940.

January 1997

10-13. Joint Mathematics Meetings, San Diego, California (including the annual meetings of the AMS, AWM, MAA, and NAM).
INFORMATION: H. Daly, AMS, P.O. Box 6887, Providence, RI 02940.
CONTEMPORARY MATHEMATICS

Domain Decomposition Methods in Science and Engineering

This book contains the proceedings of the Sixth International Conference on Domain Decomposition, held in Como, Italy. Developments in this area are driven by advances in methods using modified basis functions; very high resolution with relative ease. This approach allows for the flexibility of using different numerical methods and different models, each appropriate for the subregion at hand, to solve large problems in a cost-effective way. Containing contributions by international experts in this area, this book reports on the state-of-the-art in the growing field of domain decomposition.

Contents


Three easy ways to order: 1) call 800-321-4AMS (321-4267) in the U.S. and Canada to use VISA or MasterCard;
2) use the order form in the back of this issue; or 3) use e-mail via the Internet: cust-serv@math.amss.org.
New Publications Offered by the AMS

Commutative Algebra: Syzygies, Multiplicities, and Birational Algebra
William J. Heinzer, Craig L. Huneke, and Judith D. Sally, Editors
Volume 159

This volume contains refereed papers on themes explored at the AMS-IMS-SIAM Summer Research Conference, Commutative Algebra: Syzygies, Multiplicities, and Birational Algebra, held at Mount Holyoke College in 1992. The conference featured a series of one-hour invited lectures on recent advances in commutative algebra and interactions with such areas as algebraic geometry, representation theory, and combinatorics. The major themes of the conference were tight closure Hilbert functions, birational algebra, free resolutions and the homological conjectures, Rees algebras, and local cohomology. With contributions by several leading experts in the field, this volume provides an excellent survey of current research in commutative algebra.

Contents

1991 Mathematics Subject Classification: 13--06; 13--02, 14--06, 14--02
ISBN 0-8218-5188-8, LC 93-45007, ISSN 0271-4132
444 pages (softcover), February 1994
Individual member $37, List price $61, Institutional member $49
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Topology and Representation Theory
Eric M. Friedlander and Mark E. Mahowald, Editors
Volume 158

During 1991–1992, Northwestern University conducted a special emphasis year on the topic, “The connections between topology and representation theory”. Activities over the year culminated in a conference in May 1992 which attracted over 120 participants. Most of the plenary lectures at the conference were expository and designed to introduce current trends to graduate students and nonspecialists familiar with algebraic topology. This volume contains refereed papers presented or solicited at the conference; one paper is based on a seminar given during the emphasis year.

Contents
J. Carlson, Systems of parameters and the structure of cohomology rings of finite groups; J. Dietz, The role of the Steinberg module in splitting BG; M. J. Hopkins and B. H. Gross, Equivariant vector bundles on the Lubin-Tate moduli space; M. J. Hopkins, M. Mahowald, and H. Sadofsky, Constructions of elements in Picard groups; I. Kriz, All complex Thom spectra are harmonic; N. J. Kuhn, Constructions of families of elements in the stable homotopy groups of spheres; J. R. Martino, Classifying spaces of p-groups with cyclic maximal subgroups; N. Minami, On the classifying spaces of SLn(Z), St(Z) and finite Chevalley groups; J. H. Palmieri, The chromatic filtration and the Steenrod algebra; T. Petrie, Topology, representations and equivariant algebraic geometry; K. Shimomura and A. Yabe, On the chromatic E1-term H°M2; D. Tamaki, On a space realizing the v1-torsion part of the mod p homotopy groups of S5; M. C. Tangora, Some Massey products in Ext; M. Tezuka and N. Yagita, Calculations in mod p cohomology of extra special p-groups I; C. B. Thomas, Elliptic cohomology of the classifying space of the Mathieu group M24.

1991 Mathematics Subject Classification: 55Pxx, 55Nxx, 55Qxx, 20Cxx; 55S10, 20J06
ISBN 0-8218-5165-9, LC 93-39673, ISSN 0271-4132
318 pages (softcover), February 1994
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algorithm for the solution of contact problems; E. Fascioli, A. Quarteroni, and A. Tagliani, Spectral multidomain methods for the simulation of wave propagation in heterogeneous media; A. Gersztenkorn and J. C. Diaz, Domain decomposed preconditioning for faulted geological blocks; J.-L. Guermond and W.-Z. Shen, A domain decomposition method for simulating 2D external viscous flows; I. Lie, Interface conditions for heterogeneous domain decomposition: coupling of different hyperbolic systems; D. Mansutti and F. Pittolli, Simulation of 3D Navier-Stokes flows via domain decomposition by the modified discrete vector potential model; author index.

1991 Mathematics Subject Classification: 65M55, 65N55
ISBN 0-8218-5158-6, LC 93-36691, ISSN 0271-4132
484 pages (softcover), February 1994
Individual member $45, List price $75, Institutional member $60
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In addition, a new classification of nonlinear nonlocal equations is introduced. A large class of these equations is treated by a single method, the main features of which are apriori estimates in different integral norms and use of the Fourier transform. This book will interest specialists in partial differential equations, as well as physicists and engineers.

**Contents**

Introduction; Simplest properties of solutions of nonlinear nonlocal equations; The Cauchy problem for the Whitham equation; The periodic problem; The system of equations of surface waves; Generalized solutions; The asymptotics as t → ∞ of solutions of the generalized Kolmogorov-Petrovskii-Piskunov equation; Asymptotics of solutions of the Whitham equation for large times; Asymptotics as t → ∞ of solutions of the nonlinear nonlocal Schrödinger equation; Asymptotics of solutions for a system of equations of surface waves for large times; The step-decaying problem for the Korteweg-de Vries-Burgers equation; References.

1991 Mathematics Subject Classification: 35Lxx, 45K05; 35Q35, 76L05
ISBN 0-8218-4573-X; LC 93-8452; ISSN 0075-8922
288 pages (hardcover), February 1994
Individual member $89, List price $149, Institutional member $119
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**PROCEEDINGS OF SYMPOSIA IN PURE MATHEMATICS**

Motives

Uwe Jannsen, Steven Kleiman, and Jean-Pierre Serre, Editors

Volume 55

Motives were introduced in the mid-1960s by Grothendieck to explain the analogies among the various cohomology theories for algebraic varieties, to play the role of the missing rational cohomology, and to provide a blueprint for proving Weil’s conjectures about the zeta function of a variety over a finite field. Over the last ten years or so, researchers in various areas—Hodge theory, algebraic K-theory, polylogarithms, automorphic forms, L-functions, ℓ-adic representations, trigonometric sums, and algebraic cycles—have discovered that an enlarged (and in part conjectural) theory of “mixed” motives indicates and explains phenomena appearing in each area. Thus the theory holds the potential of enriching and unifying these areas. These volumes contain the revised texts of nearly all the lectures presented at the AMS-IMS-SIAM Joint Summer Research Conference on Motives, held in Seattle in 1991. A number of related works are also included, making for a total of forty-seven papers, from general introductions to specialized surveys to research papers.

**Contents**

cohomology, U. Jannsen, Motivic sheaves and filtrations on Chow groups; S. Lichtenbaum, Motivic complexes; M. Saito, On the bijectivity of some cycle maps; Motivic Galois groups: L. Breen, Tannakian categories; J.-P. Serre, Propriétés conjecturales des groupes de Galois motiviques et des représentations $\ell$-adiques; J. Milne, Motives over finie fields; A. Panchishkin, Motives for absolute $\ell$-Hodge cycles; N. Schappacher, CM motives and the Taniyama group; P. Deligne, Structures of $\ell$-Hodge mixte réelles; L-functions: C. Deninger, $L$-functions of mixed motives; B. Gross, $L$-functions at the central critical point; J. Nekovář, Beilinon's conjectures; A. Scholl, Height pairings and special values of $L$-functions; J.-M. Fontaine and B. Perrin-Riou, Autors des conjectures de Bloch et Kato: Cohomologie galoisienne et valeurs de fonctions $L$; C. Deninger, Motivic $L$-functions and regularized determinants; M. Schröter and C. Soulé, On a result of Deninger concerning Riemann's theta function; Part 2. Polylogarithms: R. Hain, Classical polylogarithms; A. Goncharov, Polylogarithms and motivic Galois groups; A. Beilinson and P. Deligne, Interprétation motivique de la conjecture de Zagier reliant polylogarithmes et régulateurs; A. Beilinson and A. Levin, The elliptic polylogarithm; $p$-adic and characteristic $p$-theory: R. Greenberg, Iwasawa theory and $p$-adic deformations of motives; P. Schneider, $p$-adic points of motives; A. Panchishkin, Admissible non-Archimedean standard $\mathfrak{t}$-functions associated with Siegel modular forms; D. Blasius, $p$-adic property of Hodge classes on abelian varieties; D. Goss, Drinfeld modules: Cohomology and special functions; Automorphic forms and Shimura varieties: S. Kudla, The local Langlands correspondence: The non-Archimedean case; A. Knapp, Local Langlands correspondence: The Archimedean case; D. Ramakrishnan, Pure motives and automorphic forms; J. Milne, Shimura varieties and motives; D. Blasius and J. Rogawski, Zeta functions of Shimura varieties; M. Harris, Hodge-de Rham structures and periods of automorphic forms; J. Tilouine, Galois representations congruent to those coming from Shimura varieties; K. Ribet, Report on mod $\ell$ representations of $\text{Gal}(\overline{\mathbb{Q}}/\mathbb{Q})$.

1991 Mathematics Subject Classification: 14-06; 11F70, 11G35, 14A20, 19F27
ISBN (Set) 0-8218-1635-7, (Part 1) 0-8218-1636-5, (Part 2) 0-8218-1637-3
LC 93-38970, ISSN 0082-0717
1423 pages (Set), 747 pages (Part 1), 676 pages (Part 2), (hardcover), February 1994
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A. K. Kelmans, Editor
Volume 158

This is a collection of translations of a variety of papers on discrete mathematics by members of the Moscow Seminar on Discrete Mathematics. This seminar, begun in 1972, was marked by active participation and intellectual ferment. Mathematicians in the USSR often encountered difficulties in publishing, so many interesting results in discrete mathematics remained unknown in the West for some years, and some are unknown even to the present day. To help fill this communication gap, this collection offers papers that were obscurely published and very hard to find. Among the topics covered here are: graph theory, network flow and multicommodity flow, linear programming and combinatorial optimization, matroid theory and submodular systems, matrix theory and combinatorics, parallel computing, complexity of algorithms, random graphs and statistical mechanics, coding theory, and algebraic combinatorics and group theory.

Contents
L. G. Babat, Approximate evaluation of a linear function at the vertices of the unit $n$-dimensional cube; L. G. Babat, On the growth of coefficients in an integral linear aggregation; B. V. Cherkasskii, A fast algorithm for constructing a maximum flow through a network; V. P. Grishukhin, On the extremality of the rank function of a connected semimodal lattice; V. P. Grishukhin, On polynomial solvability conditions for the simplest plant location problem; A. V. Karzanov, Minimal mean weight cuts and cycles in directed graphs; A. V. Karzanov, An algorithm for determining a maximum packing of odd-terminus cuts, and its applications; A. V. Karzanov, Maximum- and minimum-cost multicommodity flow problems having unbounded fractionality; A. V. Karzanov, On a class of maximum multicommodity flow problems with integer optimal solutions; A. K. Kel’man, On edge mappings of graphs preserving subgraphs of a given type; A. K. Kel’man, On edge semi-isomorphisms of graphs induced by their isomorphisms; A. K. Kel’man, Constructions of cubic bipartite 3-connected graphs without Hamiltonian cycles; A. K. Kel’man, Nonseparating circuits and the planarity of graph-cells; A. K. Kel’man and V. P. Poles’kii, Extremal sets and covering and packing problems in matroids; E. V. Kendys, V. M. Makarov, A. R. Rubinov, and E. M. Tishkin, Optimal distribution sorting; P. A. Pevzner, Branching packing in weighted graphs; P. A. Pevzner, Non-3-crossing families and multicommodity flows; A. D. Val’shtein, The vector shortest path problem in the $L_p$-norm; A. D. Val’shtein, Lower performance bounds for on-line algorithms in the simple two-dimensional rectangle packing problems.

1991 Mathematics Subject Classification: 05B40, 05C38, 68R05, 68R10, 90B10; 05B35, 05C10, 68P10
ISBN 0-8218-7509-4, LC 93-48534, ISSN 0065-9290
221 pages (hardcover), February 1994
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Fractal Analysis Software Package: A Fractal Generator for Windows™ 3.x
Pierre Ferland, Claude Tricot, and Axel van de Walle

The Fractal Analysis Software Package provides more than pretty pictures; it gives users a tool for pedagogy and analysis that allows exploration of the mathematical theory hidden behind the magical beauty of fractal images. Originally developed for classroom lectures and seminars, the software features an accessible geometrical approach and user-friendly environment. The user can rapidly create and render a famous family of fractal images: iterated function systems of affine application attractors. Several methods of fractal dimension estimation, such as the box counting method and the...
Minkowski sausage method, are included. The user is free to set all the parameters that control these operations and can view every step of the process. The software makes complete use of the user-friendly environment and interfacing capabilities of Microsoft Windows™ 3.x.

Contents
Installing fractal analysis; Introduction to IFS; Introduction to the fractal dimension; Fractal analysis windows description; Working with fractal analysis; List of figures.

1991 Mathematics Subject Classification: 28A80; 58F08
ISBN 0-8218-0999-7, LC 93-49353
35 pages (softcover), January 1994
Individual member $30, List price $50, Institutional member $40
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DIMACS: Series in Discrete Mathematics and Theoretical Computer Science

Groups and Computation
Larry Finkelstein and William M. Kantor, Editors
Volume 11

This volume contains papers presented at the Workshop on Groups and Computation, held in October 1991. The workshop explored interactions among four areas: symbolic algebra and computer algebra, theoretical computer science, group theory, and applications of group computation. The papers also discuss such topics as parallel algorithms for groups, computation in associative algebras, asymptotic behavior of permutation groups, the study of finite groups using infinite reflection groups, combinatorial searching, computing with representations, and Cayley graphs as models for interconnection networks.

1991 Mathematics Subject Classification: 20
ISBN 0-8218-6599-4, 313 pages (hardcover), September 1993
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Network Flows and Matching
First DIMACS Implementation Challenge
David S. Johnson and Catherine C. McGeoch, Editors
Volume 12

The DIMACS Implementation Challenge was organized to encourage experimental work in the area of network flows and matchings. Participants at sites in the U.S., Europe, and Japan undertook projects between November 1990 and August 1991 to test and evaluate algorithms for these problems. The Challenge culminated in a three-day workshop held in October 1991 at DIMACS. This volume contains the revised and refereed versions of twenty-two of the papers presented at the workshop, along with supplemental material about the Challenge and the Workshop.

1991 Mathematics Subject Classification: 68, 90
ISBN 0-8218-6598-6, 592 pages (hardcover), October 1993
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Personals
Gilbert M. Helmberg, of the University of Innsbruck, has been elected president of the Austrian Mathematical Society for 1994–1995.

Herbert Keller, of California Institute of Technology, has been named the recipient of the 1994 Theodore von Kármán Prize of the Society for Industrial and Applied Mathematics (SIAM), which is given for a notable application of mathematics to mechanics or engineering.

De Witt Sumners, of Florida State University, was recently named Distinguished Research Professor at that institution.

Deaths
Joseph Gillis, professor emeritus of the Weizmann Institute of Science, died on November 28, 1993. He was born in August 1911, and was a member of the Society for 53 years.

Nina B. Maslova, of the St. Petersburg division of the Oceanology Institute, Russian Academy of Sciences, died on November 18, 1993. She was born on May 30, 1939, and was a member of the Society for 12 years.

Kentaro Yano, professor emeritus of Tokyo Institute of Technology, died on December 25, 1993. He was born on March 1, 1912, and was a member of the Society for 42 years.

Visiting Mathematicians
Supplementary List
Mathematicians visiting other institutions during the 1993–1994 academic year have been listed in recent issues of the Notices: July/August 1993, p. 731; September 1993, p. 947; October 1993, p. 1095; and December 1993, p. 1461.

Tianxin Cai (China), California State University, Fresno, Number Theory, 9/93–6/94.

Erratum
Alan John Ellis was incorrectly reported as having died on August 22, 1992. The actual date was April 22, 1992.

Mathematics and Sports
L. E. Sadovskii and A. L. Sadovskii

This unique book presents simple mathematical models of various aspects of sports, with applications to sports training and competitions. Requiring only a background in precalculus, it would be suitable as a textbook for courses in mathematical modeling and operations research at the high school or college level. Coaches and those who participate in sports will find it interesting as well. The lively writing style and wide range of topics make this book especially appealing.

1991 Mathematics Subject Classification: 92; 90
ISBN 0-8218-9500-1, 152 pages (softcover), December 1993
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THE 1994 RATE IS $70 per inch on a single column (one-inch minimum), calculated from the top of the type; $40 for each additional ½ inch or fraction thereof. No discounts for multiple ads or the same ad in consecutive issues. For an additional $10 charge, announcements can be placed anonymously. Correspondence will be forwarded.

Advertisements in the "Positions Available" classified section will be set with a minimum one-line headline, consisting of the institution name above body copy, unless additional headline copy is specified by the advertiser. Advertisements in other sections of the classified pages will be set according to the advertisement insertion. Headlines will be centered in boldface at no extra charge. Classified rates are calculated from top of type in headline to bottom of type in body copy, including lines and spaces within. Any fractional text will be charged at the next ½ inch rate. Ads will appear in the language in which they are submitted.

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SITUATIONS WANTED ADVERTISEMENTS from involuntarily unemployed mathematicians are accepted under certain conditions for free publication. Call toll-free 800-321-4AMS (321-4267) in the U. S. and Canada, or 401-455-4084 worldwide, for further information.

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POSITIONS AVAILABLE

ALABAMA

UNIVERSITY OF ALABAMA

The Mathematical Sciences Department of the University of Alabama in Huntsville invites applications for an anticipated tenure track faculty position beginning in September 1994. Rank and salary will depend on the credentials of the appointee. A Ph.D. in mathematics or related field with emphasis in applied mathematics, evidence of good teaching skills, and excellent research ability are essential. Preferred specialty areas include discrete mathematics, mathematical modeling, fluid dynamics, differential equations, numerical analysis, and probability/statistics. Send letter of application, vita, and three letters of reference to M. H. Chang, Chairman, Mathematical Sciences Department, University of Alabama in Huntsville, Huntsville, AL 35899. Review of applicants will begin March 14, 1994, and continue until the position is filled. The University of Alabama in Huntsville is an affirmative action, equal opportunity institution.

UNIVERSITY OF SOUTH ALABAMA

Chairperson
Department of Mathematics
and Statistics

Applications are invited for the position of Chairperson of the Department of Mathematics and Statistics. Starting date for the position is September 1, 1994. Applicants must have an earned doctorate, a successful record of teaching and published research, and must qualify for appointment as Professor or Associate Professor of Mathematics or Statistics. Significant administrative and leadership skills, experience in processing government or private agency funding, and commitment to supporting research and maintaining a suitable environment for quality instruction are required.

The University of South Alabama is located in the greater Mobile area and its enrollment currently exceeds 12,500. The 27 full-time faculty (19 mathematicians and 9 statisticians) of the Department participate in undergraduate degree programs in mathematics and statistics and a masters degree program in mathematics. A wide variety of service courses for other disciplines on campus is provided. The Department has a history of strong commitment to quality teaching and is strengthening its position as a research unit.

Applicants must submit a letter of application and a detailed resume, and must arrange to have at least three current letters of reference sent by April 1, 1994, to:
Screening Committee
Department of Mathematics and Statistics, FCS 3
University of South Alabama
Mobile, AL 36688
205-460-6264

The University of South Alabama is an Affirmative Action, Equal Opportunity Educational Institution. MF/D

ARKANSAS

UNIVERSITY OF ARKANSAS
at Little Rock
Department of Mathematics and Statistics

The University of Arkansas at Little Rock invites applications for a tenure-track Assistant Professor position starting Fall 1994. Applicants must hold a Ph.D. in mathematics and have a strong commitment to teaching. Preference will be given to those candidates with active research programs in one or more of the following fields: differential equations, analysis, computational mathematics, mathematical biology. Outstanding applications in other fields will be given consideration. Salary commensurate with qualifications.

Send resume, transcripts, and three letters of reference to: Dr. Alan M. Johnson, Chair of the Search Committee, Department of Mathematics & Statistics, University of Arkansas at Little Rock, 2801 South University, Little Rock, Arkansas 72204-1099.

Applications received before March 1, 1994 will receive full consideration.

The University of Arkansas at Little Rock is an Equal Opportunity/Affirmative Action Employer and actively seeks the candidacy of minorities, women and persons with disabilities. Under Arkansas law, all applications are subject to disclosure.

CALIFORNIA

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Subject to the availability of funding, one tenure track teaching position in mathematics at the assistant professor level, salary dependent upon qualifications. Doctorate in Mathematics or related field and expertise in ordinary, partial, and/or stochastic differential equations and their applications to modeling required. Evidence of potential for excellent teaching and scholarly research required. Closing date 3/30/94; position starting 9/94. Cal Poly Pomona is actively seeking to maintain its heritage and identity as a comprehensive center of education that serves a dynamic, multicultural region (with 58% ethnic minorities). For additional information or to apply, contact: Search Committee, Mathematics Dept., California State Polytechnic University, 3801 W. Temple Avenue, Pomona, CA 91758-4033. 909-869-3467. EOE/AA

PALOMAR COMMUNITY COLLEGE

Palomar Community College, San Marcos, California seeks a full-time, tenure-track Mathematics Instructor to begin August 14, 1994. For application and position announcement call: 619-744-1150 or 727-7529, ext. 2247. Other materials required prior to February 25, 1994, include: letter of application, resume, list of math courses taught and dates last taught, confiden-
MASSACHUSETTS

ASSUMPTION COLLEGE


COLLEGE OF THE HOLY CROSS

Worcester, Massachusetts

Tenure track appointment beginning in September 1994 is available for a Ph.D. mathematician interested in teaching at an undergraduate liberal arts college. Strong commitment to teaching and research is required. Preference will be given to candidates in the fields of global analysis, mathematical physics, differential topology, and geometry. Teaching load is three courses each semester. Salary is competitive. Fringe benefits include TIAA-CREF, medical, dental, and life insurance plans and generous sabbatical and faculty fellowship programs.

Holy Cross is an affirmative action/equal opportunity employer. Women and minorities are encouraged to apply. Applications, including resume, undergraduate and graduate transcripts and three letters of recommendation evaluating teaching and scholarship should be sent to David B. Damiano, Chair. Deadline for Applications: February 1, 1994. Representatives of the Department will attend the Joint Mathematics Meeting in Cincinnati and will participate in the Employment Register. We expect to invite candidates to campus for interviews beginning in early February 1994.

MICHIGAN

CALVIN COLLEGE

Department of Mathematics and Computer Science

The Calvin College Department of Mathematics and Computer Science expects to have from two to four openings for new faculty members beginning in the fall of 1994. One opening will be a regular, tenure-track opening in statistics. There will also be one or two temporary openings in mathematics to replace faculty members who will be on leave. In addition, there may be a temporary opening in Computer Science. Candidates for all positions must have a strong commitment to undergraduate teaching and to scholarship. A Ph.D. in statistics is required for the statistics position.

Calvin College is a Christian liberal arts college in the Reformed tradition. It is owned and operated by the Christian Reformed Church. Calvin College enrolls approximately 4,000 students and graduates 25 mathematics majors each year.

Applications will be accepted at any time, but applications received before February 28 will be given first priority. Applicants should forward a curriculum vitae, graduate transcripts, and three letters of reference to: Chair, Search Committee, Department of Mathematics and Computer Science, Calvin College, Grand Rapids, MI 49546. Inquiries may be sent to the address above or via electronic mail to math@calvin.edu. Calvin College is an equal opportunity employer.

OAKLAND UNIVERSITY

Department of Mathematical Sciences

The Department of Mathematical Sciences at Oakland University invites applications for a possible tenure-track position at the rank of Assistant Professor in the area of applied discrete mathematics.

Responsibilities of this position include teaching, research, and contribution to the department's collaborative efforts with industry. Candidates must have a Ph.D. in mathematics or a closely related discipline (or its requirements completed) by August 15, 1994. Preference will be given to applicants with strong research potential in applied discrete mathematics. Ability to interact with local industry is highly desirable. Please send a vita and transcripts, and arrange for three letters of reference to be sent to: Chair, the Applied Discrete Mathematics Search Committee, Department of Mathematical Sciences, Oakland University, Rochester, Michigan 48309-4401. Review of applications will begin on March 1, 1994.

Oakland University is a public institution with approximately 13,000 students enrolled in baccalaureate, masters, and doctoral programs. Oakland University is an Affirmative Action/Equal Opportunity Employer and especially encourages applications from women and minorities.

MINNESOTA

UNIVERSITY OF MINNESOTA, MORRIS

Division of Science and Mathematics

Mathematics: Tenure-track position at Associate Professor or Professor level in mathematics begins September 16, 1994. Duties: teach undergraduate mathematics, pursue research, and share in service activities. Minimum qualifications: Ph.D. in mathematics and five years undergraduate teaching experience. Applied mathematicians are especially encouraged to apply. Send letter of application, resume, official transcript, and three letters of reference to: Dr. L. Korth, Chair, Division of Science and Math, University of Minnesota, Morris, MN 56267-2128 to arrive by February 28, 1994. The University of Minnesota is an equal opportunity educator and employer.
NEW JERSEY
RICHARD STOCKTON COLLEGE
OF NEW JERSEY
MATHEMATICS: The Richard Stockton College of New Jersey seeks a full-time Instructor/Assistant Professor in well established, innovative interdisciplinary curriculum (starting date, Sept. 1, 1994; tenure track position). Teaching experience and Masters in relevant area required for Instructor ($26,184-$30,110). Teaching experience and doctorate in relevant area required for Assistant Professor ($31,828-$36,603). Evidence of experience in innovative math teaching and of commitment to math skills enhancement required. Salary may be higher depending on qualifications, experience, and increases in the New Jersey Higher Education Compensation Plan. Screening begins February 25, 1994. Send letter of application, resume, and three letters of recommendation to Dr. G. Jan Colijn, Dean of General Studies, The Richard Stockton College of New Jersey, AA75, Pomona, New Jersey 08240. Stockton is an AA/EEO. Women and minorities are encouraged to apply. R402578

WILLIAM PATERSON COLLEGE
Mathematics Department
One tenure-track position in statistics at the Assistant Professor level beginning September 1, 1994. Must possess Ph.D. in statistics. Strong evidence of commitment to quality undergraduate teaching and on-going research program are essential. Computer facilities are available for teaching and research purposes. Salary is dependent upon background and experience. Letter of application, curriculum vitae and three letters of reference concerning teaching and research abilities by March 1, 1994, to Sandeep Maheshwari, Chairperson, Department of Mathematics, William Paterson College, 30 Pompton Road, Wayne, NJ 07470. EOE/AA

POTSDAM COLLEGE
Assistant Professor
Potsdam College of the State University of New York invites applications for two full-time, tenure-track positions in mathematics beginning September 1, 1994. Ph.D. in mathematics is required. Application review will begin as received and continue until the position is filled. Application review will begin as received and continue until the position is filled. The department has 13 members and offers a BA and an MA in mathematics. A letter of application, vita, three letters of recommendation, and curriculum vitae should be sent to: Professor John J. Walsh, Department of Mathematics, Potsdam College, Potsdam, NY 13676.

NORTH CAROLINA
WAKE FOREST UNIVERSITY
Department of Mathematics and Computer Science
Applications are invited for a position as Instructor or Visiting Assistant Professor in Mathematics. The term is one year, renewable for up to three years. Rank is dependent upon qualifications, and a Master’s or Ph.D. degree in Statistics or Mathematics is required with preference being given to holders of a statistics degree for this position. Duties consist of teaching three courses per semester. A strong interest and preparation for teaching introductory statistics and calculus is desirable. The department has 22 members, offers a B.S. and M.A. in mathematics, and a B.S. and M.S. in computer science. Send a letter of application and resume to Richard D. Carmichael, Chairman, Department of Mathematics and Computer Science, Wake Forest University, Box 7388, Winston-Salem, NC 27109. AA/EO Employer.

NEW YORK
COLLEGE OF STATEN ISLAND
The College of Staten Island, a comprehensive four-year senior college of the City University of New York (CUNY), invites applications for a tenure-track position at the Assistant Professor level in Mathematics beginning September 1, 1994. The College offers a broad curriculum encompassing both the liberal arts and the sciences. Areas of particular need are: applied statistics, applied probability, stochastic processes, numerical analysis, wavelet theory. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, CUNY, 2800 Victory Boulevard, Staten Island, NY 10314 by March 1, 1994. CUNY is an Equal Opportunity/Affirmative Action Employer.

POLYTECHNIC UNIVERSITY
Department of Mathematics
We anticipate at least one tenure track assistant professor position beginning September 1994. Candidates must have a record of excellence and commitment to teaching, research, and service. Preference will be given to candidates whose research is in geometric analysis or in areas related to strengths in other departments at Polytechnic. Preference will also be given to candidates with experience in the teaching and development of precalculus and calculus curricula. A Ph.D. in mathematics is required.

A letter of application, vita, description of research and teaching experience, and at least three letters of recommendation on both research and teaching should be sent to:

Search Committee
Department of Mathematics
Polytechnic University
Six MetroTech Center
Brooklyn, NY 11201
EOE/AA

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POTSDAM COLLEGE
Assistant Professor
Potsdam College of the State University of New York invites applications for two full-time, tenure-track positions in mathematics beginning September 1, 1994. Ph.D. in mathematics is required. Application review will begin as received and continue until the position is filled. The department has 13 members and offers a BA and an MA in mathematics. Send a letter of application, vita, three letters of recommendation, and curriculum vitae to:

Professor John J. Walsh
Department of Mathematics
Potsdam College
Potsdam, NY 13676

The College of Staten Island, a comprehensive four-year senior college of the City University of New York (CUNY), invites applications for a tenure-track position at the Assistant Professor level in Mathematics beginning September 1, 1994. The College offers a broad curriculum encompassing both the liberal arts and the sciences. Areas of particular need are: applied statistics, applied probability, stochastic processes, numerical analysis, wavelet theory. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, CUNY, 2800 Victory Boulevard, Staten Island, NY 10314 by March 1, 1994. CUNY is an Equal Opportunity/Affirmative Action Employer.

CLASSIFIED ADVERTISEMENTS

POLYTECHNIC UNIVERSITY
Department of Mathematics
We anticipate at least one tenure track assistant professor position beginning September 1994. Candidates must have a record of excellence and commitment to teaching, research, and service. Preference will be given to candidates whose research is in geometric analysis or in areas related to strengths in other departments at Polytechnic. Preference will also be given to candidates with experience in the teaching and development of precalculus and calculus curricula. A Ph.D. in mathematics is required.

A letter of application, vita, description of research and teaching experience, and at least three letters of recommendation on both research and teaching should be sent to:

Search Committee
Department of Mathematics
Polytechnic University
Six MetroTech Center
Brooklyn, NY 11201
EOE/AA

The College of Staten Island, a comprehensive four-year senior college of the City University of New York (CUNY), invites applications for a tenure-track position at the Assistant Professor level in Mathematics beginning September 1, 1994. The College offers a broad curriculum encompassing both the liberal arts and the sciences. Areas of particular need are: applied statistics, applied probability, stochastic processes, numerical analysis, wavelet theory. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, CUNY, 2800 Victory Boulevard, Staten Island, NY 10314 by March 1, 1994. CUNY is an Equal Opportunity/Affirmative Action Employer.

NEW YORK
COLLEGE OF STATEN ISLAND
The College of Staten Island, a comprehensive four-year senior college of the City University of New York (CUNY), invites applications for a tenure-track position at the Assistant Professor level in Mathematics beginning September 1, 1994. The College offers a broad curriculum encompassing both the liberal arts and the sciences. Areas of particular need are: applied statistics, applied probability, stochastic processes, numerical analysis, wavelet theory. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, CUNY, 2800 Victory Boulevard, Staten Island, NY 10314 by March 1, 1994. CUNY is an Equal Opportunity/Affirmative Action Employer.

OHIO
Cleveland State University
Assistant Professor in Mathematics
The Mathematics Department invites applications for a tenure-track position at the Assistant Professor level. Candidates must have completed a Ph.D. in a mathematical science by the starting date and must have demonstrated a commitment to excellence in both teaching and research. Applicants must have research specialization in one of the following areas: applied statistics, applied probability, stochastic processes, numerical analysis, wavelet theory. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, Cleveland State University, Cleveland, OH 44115. (Funding for this position is pending.) Starting Date: September 19, 1994. Salary competitive: Deadline for applications: February 4, 1994. Minorities, women, and handicapped are particularly encouraged to apply. Cleveland State University is an Equal Opportunity/Affirmative Action Employer.
CLEVELAND STATE UNIVERSITY
Visiting Instructor/Assistant Professor in Mathematics

The Mathematics Department invites applications for one or more visiting positions at the Instructor/Assistant Professor level. To be appointed as a Visiting Assistant Professor, candidates must have completed a Ph.D. in a mathematical science by the starting date. To be appointed as a Visiting Instructor, candidates must have a Master's Degree in a mathematical science and be well advanced upon doctoral study in a mathematical science. Candidates must have demonstrated a commitment to excellence in both teaching and research and must be able to teach upper and lower division undergraduate mathematics courses. Applicants must have research specialization that is currently represented in the Department. Applicants should arrange to have a vita and three letters of recommendation sent to Professor John J. Walsh, Department of Mathematics, Cleveland State University, East 24th & Euclid Avenue, Cleveland, Ohio 44115. (Funding for these positions is pending.) These positions are for the academic year 1994–1995 and are not eligible for tenure. Starting Date: September 19, 1994. Salary range for Visiting Instructor is $29,000–$32,000. Salary range for Visiting Assistant Professor is $32,000–$35,000. Deadline for Applications: March 1, 1994. Salary open, application review begins April 1. Position open until filled. Starting Date: September 15, 1994. CSU is an Affirmative Action/Equal Opportunity Employer. Reasonable accommodation provided for disabilities.

DENISON UNIVERSITY

The Department of Mathematical Sciences anticipates a two-year position with the possibility for renewal at the level of Assistant Professor starting in Fall 1994. Eventual conversion to tenure-track is likely. A doctorate (or ABD) in mathematics is required. Ability to teach statistics or "computer literacy" courses a plus, but not required. A commitment to quality undergraduate instruction is essential. Duties include teaching three courses per semester and continued scholarship.

Denison is a liberal arts college of about 1900 students located in a village of about 4000, twenty-five miles east of Columbus. The department offers B.A. and B.S. degrees in mathematics and in computer science. The department consists of nine full-time members.

Send resume, transcripts of graduate work, and three letters of recommendation (at least one should address your teaching) to Professor Todd Feil, Chair, Department of Mathematical Sciences, Denison University, Granville, Ohio 43023.

Applications should be made by February 1, 1994; applications beyond this date will be considered until the position is filled. Denison is an Affirmative Action/Equal Opportunity Employer; women and minorities are encouraged to apply.

THE OHIO STATE UNIVERSITY
AT MARION

The Ohio State University at Marion has a tenure-track opening for an Assistant Professor of Mathematics, effective autumn 1994. A Ph.D. in mathematics is required. Candidates in all areas of applied and pure mathematics are invited to apply. A strong commitment to undergraduate teaching and to mathematical research is essential. The successful candidate will hold rank in The Ohio State University's Department of Mathematics.

Please send letter of application, vita, and publication list to Professor Brian W. Melms, The Ohio State University at Marion, 1465 Mt. Vernon Avenue, Marion, Ohio 43302-5695. Review of applications will continue until the position is filled.

The Ohio State University is an Equal Opportunity, Affirmative Action Employer. Women, minorities, Vietnam-era veterans, disabled veterans, and individuals with disabilities are encouraged to apply.

PENNSETTENNA

MANSFIELD UNIVERSITY

Mansfield University, Mansfield, PA, seeks to fill a tenure track faculty position in mathematics beginning August 1994. Doctorate in mathematics required for tenure. A person who has completed the necessary course work for the doctorate (ABD) will be considered if a mutually acceptable completion date can be established. Evidence of successful teaching of collegiate mathematics is also required. Send a letter of application, resume, transcripts of all academic work, and three current letters of recommendation by March 1, 1994. Direct all correspondence to: Position F-171, Human Resources Department, Mansfield University, Mansfield, PA 16933. Please refer to Position F-171 in all correspondence. Mansfield University is an Affirmative Action Employer and encourages the applications of women, minorities, and the physically and mentally challenged.

TENNESSEE

MEMPHIS STATE UNIVERSITY
Department of Mathematical Sciences

The Department of Mathematical Sciences invites applications for anticipated tenure track positions in mathematics, at the level of Assistant Professor, in any area of probability or dynamical systems. Candidates are expected to have strong research potential and to be committed to excellence in teaching at all levels. Applicants must have a Ph.D. by September 1, 1994.

The Department also expects to fill several visiting positions in mathematics, statistics, and computer science. Preference will be given to those applicants whose research areas coincide with the research interests of current faculty.

The Department offers degrees at all levels including the Ph.D. and provides a very favorable research environment in terms of library and computing facilities, teaching load, travel opportunities, etc. The selection process will begin in February 1994, and continue until all positions are filled. Women and minorities are strongly urged to apply. Successful candidates must meet Immigration Reform Act criteria. Applicants should submit a curriculum vitae and direct letters of reference to:

James E. Jamison, Chair, Faculty Search Committee
Department of Mathematical Sciences
Memphis State University
Memphis, TN 38152
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UTAH

UNIVERSITY OF UTAH

University of Utah, Department of Mathematics, invites applications for the following positions. Availability of positions is contingent upon funding. 

1. One full-time tenure track appointment on the professorial level in mathematics applicable to materials science. Applicants must have received their Ph.D. degrees prior to 1993. Selection will be based on research and teaching ability.

2. One C. R. Wylie Instructorship. The term of this instructorship is one year, but it may be renewed for up to three years. It will be awarded either to an incoming instructor or to one of the Instructors already in residence on the basis of ability and potential in teaching and research. The stipend is $38,000. Duties consist of teaching four courses during the three quarter academic year.

3. One or more visiting faculty positions of one year or less in any of the professorial ranks. Selection will be based on potential contributions to the department's research program and on teaching ability. Applications for all positions will be accepted until January 31, 1994, or until all positions are filled.

Applications for any of these positions should include curriculum vitae, bibliography, and three letters of reference. (Instructorship applications should also include an abstract of the thesis and either a list of graduate courses completed or a transcript of graduate work.) Visiting faculty applications should indicate the portion of the three-quarter academic year during which the applicant wishes to visit. Please send your application to Committee on Staffing, Department of Mathematics, 233 JWB, University of Utah, Salt Lake City, Utah 84112. The University of Utah is an Equal Opportunity, Affirmative Action Employer and encourages applications from women and minorities, and provides reasonable accommodation to the known disabilities of applicants and employees.
VERMONT  UNIVERSEITY OF VERMONT  Assistant Professor in  Applied Mathematics

The Department of Mathematics and Statistics invites applications for a tenure-track assistant professorship in applied mathematics. Duties include teaching two courses per semester, research in applied mathematics, and service on departmental committees. Applicants should have strong research credentials and possess the Ph.D. degree in applied mathematics or a closely related discipline with a research specialty in an area compatible with the interests of present faculty members. These areas include mathematical modeling in biomechanics, hydrodynamic stability and nonlinear waves, and computational methods. Teaching experience is also desirable. Preference will be given to applicants with strong modeling and computational backgrounds who can collaborate effectively with engineers and with physical and medical scientists on research problems of interdisciplinary interest.

Applicants should send a vitae, description of research, and three letters of reference to: Prof. Roger Cooke, Personnel Committee, Department of Mathematics and Statistics, University of Vermont, Burlington, VT 05401-1455. Review of applications will begin March 1, 1994; duties begin in the Fall Semester 1994. The University of Vermont is an Equal Opportunity/Affirmative Action Employer. Women and members of other underrepresented groups are particularly encouraged to apply.

AUSTRALIA  UNIVERSITY OF MELBOURNE  Department of Mathematics
Research Fellow Grade 1 (Temporary)  Geometry and Topology Group

Applications are invited for the above position funded by the Australian Research Council (ARC). The grant held by Prof. W. Neumann and Dr. C. Hodgson is for a project entitled "Topology, Geometry, and Number Theory of 3-Manifolds".

Applicants should have expertise in hyperbolic geometry, low-dimensional topology, or number theory. A strong background in computing is also desirable. The applicant must have a Ph.D. or equivalent qualification.

The position will commence on 14 March 1994, or as soon as possible thereafter. The duration will be for up to two years initially with a possible extension for a further year.

Salary: A$28,700-$38,950 (Research Fellow Grade 1).

Further Information: Prof. Walter Neumann (+613) 344-6587, electronic mail: neumann@mundoe.maths.mu.oz.au) or Dr. Craig Hodgson (+613) 344-5547, electronic mail: cdh@mundoe.maths.mu.oz.au)


Applications should be sent in duplicate, quoting three referees to Dr. C. Hodgson, Department of Mathematics, The University of Melbourne, Parkville, Victoria 3052, Australia.

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Classified Advertisements

ENGLAND  IMPERIAL COLLEGE  (University of London)  Department of Mathematics  Temporary Lectureship in  Pure Mathematics (Ref: PI/AMS)

Applications are invited for a temporary lectureship in the Department of Mathematics, to run from the beginning of October 1994, to the end of December 1996. Applicants should have research strength in Pure Mathematics; the field of Number Theory is of particular interest to the Department. The successful applicant will be expected to teach students in the Mathematics Department and to provide service teaching to other Departments within the College.

Salaries will be within the lecturer's scale £13,601-$25,107 p.a. plus London Allowance of £2,134 p.a.

Applications, with a CV, list of publications and names of at least three referees, and a stamped addressed envelope for an acknowledgement and further details, should be sent by Friday 25 February 1994 (quoting reference number given above) to: Prof. A. F. M. Smith, Mathematics Department, Imperial College, 180 Queen's Gate, London SW7 2BZ; tel: 071-589 5111 ext 5701; fax: 071-225 8361; e-mail: a.smith@ic.ac.uk.

TURKEY  BILKENT UNIVERSITY

The Department of Mathematics invites applications for visiting faculty positions at all levels starting September 1, 1994. The department is particularly interested in candidates whose research interests are related to algebraic geometry, algebraic topology, functional analysis, or mathematical physics. However, outstanding candidates from all areas of pure and applied mathematics are invited to apply. Duties include teaching and research at all levels. Salary is commensurate with background and experience.

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Applicants should send a vita, list of publications, and a statement of current and planned research, and arrange to have at least three letters of recommendation sent to: The Department of Mathematics, Bilkent University, 06533 Bilkent, Ankara, Turkey. Further inquiries can be made through e-mail to arf@bilkent.edu.tr.

The search committee will begin its evaluation on April 15, 1994. However, later applica-
Applications and recommendations are invited for a one- or two-year half-time appointment as an Associate Editor of Mathematical Reviews (MR), to commence in September 1994. In particular applications will be welcome from persons taking a sabbatical leave. The salary is negotiable and will be commensurate with the experience the applicant brings to the position.

The MR office of the American Mathematical Society is located in Ann Arbor, Michigan, close to the campus of the University of Michigan. The editors, although employees of the AMS, enjoy many privileges at the University. At present MR employs twelve mathematical editors, several consultants, and over sixty nonmathematicians. It produces Mathematical Reviews, Current Mathematical Publications, various indexes, the on-line service MathSci, and MathSci Disc. The responsibilities of an Associate Editor fall primarily in the day-to-day operations of selecting articles and books suitable for review, classifying these items, assigning them to reviewers, editing the reviews when they are returned, and correcting the galley proof. An individual with considerable breadth in pure or applied mathematics is sought, and preference will be given to those applicants with expertise in partial differential equations and/or numerical analysis. The ability to write good English is essential and the ability to read mathematics in major foreign languages is important.

Applications including curriculum vitae, bibliography, and names and addresses of at least three references should be sent to

Dr. D. G. Babbitt  
Executive Editor  
Mathematical Reviews  
P. O. Box 8604  
Ann Arbor, MI 48107-8604  
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Textures is something of a Copernican revolution in \TeX interface. The paradigm shifts from the usual \TeX “input–process–output–repeat” mode, to a wider frame wherein the \TeX language describes a dynamic document that is continuously, quietly “realized” as you write it, with no process steps whatsoever.

This change in perspective must be experienced to be fully grasped. As you would expect, Textures is good for beginners. You might be surprised to know that it’s also good for experienced \TeX users and especially good for \TeX programmers.\footnote{2} It’s not a “front-end” or an imitation, it’s a full-scale live \TeX processor that’s actually easy to use.

There’s much more to Textures than a new perspective on \TeX, of course; too much to list here but we’ll mention custom menus, Computer Modern PostScript fonts, illustrations, inter-application communication, automatic installation, genuine support, . . . .

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\footnote{2}{If you are a serious \TeX user on another platform, it can be worth getting a Mac just to run Textures.}
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Supported by the National Science Foundation

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The Tutors: Donald Drew, Patrick Hagan, Ellis Cumberbatch, Gerald Young, David Ross, and Colin Please

Application Procedure: Mathematicians who teach undergraduates are invited to apply. Two letters of recommendation required, one from the departmental chairperson, as well as the applicant's curriculum vitae and statement of background and interest in employing modeling in the undergraduate math curriculum. Prerequisites: PhD in mathematics or applied mathematics, some ODE and PDE, computational experience and some physics background. The IMA will cover local living expenses but not travel. Selection criteria will include background and motivation as well as geographic and institutional diversity. Women and minorities are especially encouraged to apply.

All correspondence should be sent to MATHEMATICAL MODELING, C.O. AVNER FRIEDMAN, DIRECTOR, at the Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church Street S.E., Minneapolis, Minnesota 55455, before March 15, 1994.

UNIVERSITY OF VIRGINIA
DEPARTMENT OF APPLIED MATHEMATICS

CHAIR

The University of Virginia invites applications and nominations for the position of Chair, Department of Applied Mathematics. The Department, which is in the School of Engineering and Applied Science, has a full-time faculty of eleven, and has numerous active research programs grouped in three major areas: continuum mechanics, control theory, and numerical analysis/scientific computing. The Department offers B.S., M.S., and Ph.D. degrees in Applied Mathematics and is responsible for all undergraduate and graduate education in Applied Mathematics within the School of Engineering and Applied Science.

Candidates for the position must have a Ph.D. degree and an outstanding record of research and scholarship in Applied Mathematics. Also, they must have a firm knowledge of the best programs in Applied Mathematics nationally and internationally. A clear commitment to academic leadership, teaching, and administration within an environment dedicated to engineering and applied science is expected. Women and ethnic minority candidates are encouraged to apply. Priority will be given to applications received by March 1, 1994.

Applications should be sent to:
Professor Paul Allaire
Chair, Search Committee
c/o Department of Applied Mathematics
Thornton Hall
University of Virginia
Charlottesville, VA 22903-2422

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Idempotent Analysis
V. P. Maslov and S. N. Samborskii, Editors

The articles in this collection show how idempotent analysis is playing a unifying role in many branches of mathematics related to external phenomena and structures—a role similar to that played by functional analysis in mathematical physics, or numerical methods in partial differential equations. Such a unification necessitates study of the algebraic and analytic structures appearing in spaces of functions with values in idempotent semirings. The papers collected here constitute an advance in this direction.

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Nonlinear Stokes Phenomena
Yu. S. Il’yashenko, Editor

The nonlinear Stokes phenomenon occurs in the local theory of differential equations and finds application in singularity theory. This book contains a number of papers on this subject, including a survey that begins with Stokes’ pioneering works on linear theory, and discusses the work of Voronin.

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In 1637, Pierre de Fermat wrote his legendary marginal comment that $x^n + y^n = z^n$ has no solution in positive integers when $n \geq 3$. Fermat’s Last Theorem has eluded proof over the centuries, stimulating a great deal of mathematical development. In 1993, Andrew Wiles announced his proof of this celebrated theorem. Wiles’s main result, a special case of the Taniyama Conjecture, relies on a wide range of mathematical tools developed over the past ten years. A crucial link was a 1986 theorem that the Taniyama Conjecture implies Fermat’s Last Theorem, proved by Kenneth Ribet, who gives the two lectures on this videotape. Presented just weeks after Wiles’s now-historic announcement, these expository lectures describe the main ingredients in Wiles’s results. The lectures would be accessible to advanced undergraduates and graduate students with some background in algebra and number theory.
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