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# From the AMS

## 1996 Reports of the AMS Policy Committees

In 1992, the Council of the AMS decided to reorganize its committee structure. At that time there were already two so-called “policy committees”, one on education policy and the other on science policy. To these were added three more policy committees: one on the profession, one on meetings and conferences, and one on publications. The skeleton charge given to all of these committees was as follows:

- a. to provide advice to the leadership of the Society and to make recommendations as to Society policy;
- b. to be responsible for taking a long-range view in their areas;
- c. to conduct an annual high-level review of activities and structure within their areas and evaluate progress towards Society goals;
- d. to report regularly to the membership, both in writing and by presentations at meetings;
- e. to maintain communications with the membership and to keep aware of their views;
- f. to coordinate with other professional organizations.

The *Notices* of the AMS conceived of itself, as the journal of record for the Society, as an appropriate vehicle to execute (d): reporting regularly to the membership in writing. Thus, we invited the chairs of each of the policy committees to submit a report for publication in this, the March issue of the *Notices*.

## Committee on Publications (CPUB)

*Steven G. Krantz, Chair*

The committee (CPUB) met once in the spring of 1996 and conducted its other business by e-mail.

The committee formulated a resolution to the AMS staff to strive for simplicity in the creation of all electronic

products and services. The resolution was adopted by Council at its Seattle meeting.

CPUB also formulated recommendations on the appropriate etiquette for rejecting abstracts and journal submissions.

The committee was asked whether objections to a recent book review in the *Bulletin* warranted a reconsideration of *Bulletin* policy toward rebuttals to book reviews. The decision was that no action was necessary.

CPUB recommended to the ECBT that the AMS develop a “Member CD-ROM” to provide information to mathematicians worldwide who have limited or unreliable access to the Internet. The ECBT in turn asked the president to appoint a task force to recommend the editorial content of such a CD-ROM and the AMS staff to provide a technical and financial analysis. Both of these were done, and the ECBT at its November 1996 meeting approved the recommendation of the task force and directed the AMS staff to proceed with the production, promotion, and distribution of the Member CD-ROM.

The chair of CPUB appointed a task force to study the AMS primary journals and report on the role they play in the Society and whether they serve the membership.

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## Committee on Education (CoE)

*Hyman Bass, Chair*

The American mathematics community, unlike those of its sister sciences, has historically separated its interests in research (AMS) and in education (MAA). As our profession is changing, in response to economic, demographic, and social pressures, it is recognized that we must adopt more holistic views of professional needs. In education, in particular, there is an important and complex role for the re-

search community. This applies to enhancements of graduate programs to prepare future faculty for their roles as teachers, to greater attention to the quality of undergraduate instruction for diverse student populations, to improved efforts in courses for future school teachers of mathematics, and to outreach in national efforts to improve mathematics instruction in schools.

In these conditions the Committee on Education was created in 1990 to give a locus for focused discussion and review of educational issues of concern to the Society. Its activities include advising the Society leadership on policy matters, informing the membership through reports and programs at Society meetings, and liaison (and, when appropriate, collaboration) with other organizations such as JPBM, MAA, AMATYC (American Association of Two-Year Colleges), and NCTM (National Council of Teachers of Mathematics). These connections are an important aspect of the bridge building between the research community and the diverse education communities that is needed to facilitate more cohesive progress toward educational improvement. Connections with organizations representing other scientific disciplines are also likely to be strengthened as a result of increased emphasis on undergraduate education and crossdisciplinary interaction.

Following are some prominent items among the current activities of the Committee.

**TIMSS (Third International Mathematics and Science Education Study):** This is a massive study of both student achievement (of half a million students) and of educational design and practice in mathematics and science teaching at three levels (fourth grade, eighth grade, and last year of high school) in forty-one countries. The rich data base provided, which is susceptible to fruitful secondary analysis, gives an unprecedented opportunity for comparative study of American education in mathematics and science. As the TIMSS data are released in stages over the current year, it will be desirable to orchestrate informed public discussion of their significance and potential. The AMS Committee on Education is collaborating with other organizations in this effort. Reports on TIMSS-related material were presented at its recent meetings, from both Lois Peak, of the National Center for Educational Statistics, and from Joan Ferrini-Mundy and Danny Goroff from MSEB. The Committee on Education is sponsoring a program at the San Diego annual meeting (January 1997) featuring Jim Stigler and Al Manaster, who were involved in an unprecedented video study of eighth-grade mathematics lessons in the U.S., Japan, and Germany. Another TIMSS-related program is sponsored by MER. Further, the Education home page on the AMS Web site (URL is <http://www.ams.org/committees/education/>) provides information and links to TIMSS reports.

**Other Committee on Education-sponsored programs at the San Diego meeting:** a workshop for graduate students on career information (S. Rankin and D. Hughes Hallett), K-12 intervention (J. Roitman and S. Addington), and jointly with the Committee on Professional Programs and Services a session on professional development (C. Bennett).

**NCTM, Standards 2000:** The NCTM is embarking on a revision and synthesis of its Curriculum, Teaching, and As-

essment Standards, to be published as a single volume in the year 2000. These Standards have been the subject of lively public discussion, and some mathematicians have urged a stronger involvement of professional mathematicians in their formulation. The NCTM is seeking feedback from the various professional communities in this effort. To facilitate this, it has invited the AMS, among other organizations, to form a resource group to assist the NCTM writing team, chaired by Joan Ferrini-Mundy. To this end the Committee on Education has formed a Subcommittee on AMS/NCTM2000, chaired by Roger Howe, which will review draft materials from the NCTM. This subcommittee has been given the broader charge of fostering more informed and critical public discussion and review of some of the scholarly literature on teaching and learning that bears on the issues addressed by the Standards. The Subcommittee membership, still being assembled, includes Richard Askey, Hyman Bass, Wayne Bishop, Roger Howe, Alfred Manaster, David Moore, Judy Roitman, and Mark Saul.

**MR coverage of educational research:** There is a growing community of scholars, some initially trained as research mathematicians, who are turning their attention to research in mathematics education, with an emphasis on undergraduate education. Some of these people hold positions in mathematics departments. Yet there is virtually no professional recognition of, and little convenient access to, this scholarship within the AMS community. As a modest first gesture in this direction, the COE was asked to consider the possibility that MR (*Mathematical Reviews*) extend coverage to an appropriate sector of the literature on educational research. This is a policy matter that lies within the jurisdiction of the MR Editorial Committee (MREC). It also raises issues of cost and staff expertise. In cooperation with the MREC, the Committee on Education has appointed a subcommittee, chaired by Joan Ferrini-Mundy, to investigate the desirability and feasibility of extending MR coverage in this way.

**MAA Project NEXT:** The AMS Committee on Education is exploring ways to collaborate with the MAA in support of this very successful program.

**Committee meetings:** On an experimental basis, partly for reasons of economy, the Committee will have only one plenary meeting in 1997, with a small executive committee meeting once more in conjunction with the meeting of the Committee on Science Policy.

## Committee on Meetings and Conferences (COMC)

*Sylvia Wiegand, Chair*

The Committee on Meetings and Conferences (COMC) reviews and recommends policy for all aspects of the Society's meetings and conferences. COMC provides annual reviews, reports and communicates to the membership, and coordinates its activities with other AMS committees, par-

ticularly those activities involving meetings and conferences.

Besides conducting a great deal of its business by electronic mail correspondence, COMC had two face-to-face meetings in 1996, in April and September. Some of the highlights of the year's activities follow. The recommendations listed (I.1.2 and I.2.2 ) were to be considered by the Council at the January 1997 meeting in San Diego.

I. COMC has a six-year plan for reviews of the various facets of the AMS Meetings and Conferences program. The two items scheduled for 1996 were completed, and work has begun on the items for 1997. Specifically:

I.1. Evan Houston, chair, Deborah Sulsky, and William Harris served on the COMC Subcommittee to Review Co-sponsorship of Meetings and Conferences of Other Organizations (CSSC), which was charged with performing a six-year review of co-sponsorship by the Society of meetings and conferences of other organizations. The committee examined the history of past co-sponsorships and developed goals and guidelines for future ones. The modern history of co-sponsorships dates to 1988, when a Committee on Cooperative Symposia was created to generate and review ideas for co-sponsoring sessions involving applications of mathematics; this committee was discharged in January 1992. Since then simple requests for co-sponsorship have been handled by the Secretariat. This procedure appears to work well.

The CSSC also prepared a guidelines statement concerning co-sponsorship agreements, proceedings, and program committee appointments, which COMC has recommended be adopted by the Council.

I.2. Roy Adler, chair, Robert Daverman, Andy R. Magid, and Jerry Marsden reported for the Subcommittee to Review International Joint Meetings.

The Subcommittee on International Joint Meetings was formed in September 1995 with the charge "To review and report to COMC and, through them, to the Council as appropriate the operation of international joint meetings, including financial, scientific, and organizational aspects." They also considered procedural aspects of international joint meetings.

The subcommittee commented that "International joint meetings are valuable for the AMS membership: this cooperation with other societies enhances the image of the AMS and provides a richer program of meetings and conferences. Mathematicians and scientists in other countries value the opportunity to invite AMS members and to make scientific and personal contacts with them. International joint meetings are a relatively new endeavor for the AMS, and procedures are still being developed. The AMS is doing an excellent job with the meetings, and they have been well received. The subcommittee considered procedural aspects and other issues that may arise during the course of the review. The program seems to be successful and should be continued."

COMC has recommended some procedural and policy items regarding international joint meetings to the Council. These include: the development of written guidelines, the involvement of people who already have contact with the country (e.g., who can speak the language and have sub-

stantial scientific contacts), and reports about each international joint meeting for future evaluation and information.

I.3. The reviews scheduled for 1997 are (1) Sectional Meetings; a subcommittee for this review will be chaired by Evan Houston, with Case, Daverman, and Sulsky; and (2) AMS sessions at Meetings of Other Organizations, to be chaired by Isom Herron, with additional members Hyman and Marsden. The scope of this latter subcommittee will be expanded to include consideration of sessions of other organizations at AMS meetings, because it is important for the AMS to be involved in interdisciplinary mathematics. In addition to these review subcommittees, COMC will form another subcommittee to study national meetings of the future.

## II. Other Items

II.1. COMC has initiated the formation of a Joint Task Force on Interdisciplinary Activity with CPUB. When COMC reviewed interdisciplinary conferences, it appeared that the publication of proceedings led to problems. This task force, which will be named soon, will be charged to consider and facilitate proceedings of interdisciplinary conferences.

II.2. COMC has contacted the chair of CoE about the formation of a Joint COMC-CoE Subcommittee on Student Activities. This subcommittee would be charged to catalog and unify existing programs as well as to encourage and suggest new programs.

II.3. In the area of long-range planning for the conferences program, COMC considered the possibility of significant future cuts in funding for the summer conference program by the granting agencies (in view of the budget situation in Washington, DC). COMC discussed past attendance, topics, and organizers of summer conferences. In view of the potential for loss of funds, COMC recommended that only the highest-quality proposals be submitted to granting agencies in the future. In the event of severe cutbacks, the Society itself could perhaps partially support the series for one year, but not on an ongoing basis.

II.4. Some concern has been communicated to COMC that National Meetings no longer appeal to those mathematicians primarily interested in doing research. COMC discussed this issue by e-mail and at its meetings and will continue to explore it. (One question is whether the perception is accurate.)

II.5. COMC has assisted the AMS office with ideas for the Meetings and Conferences page on the WWW. It is hoped that this new technology will make access to information about meetings and conferences easier for members and also that members will assist with obtaining meetings information for the Web.

II.6. Progress has been made on various recommendations from COMC which appeared in previous reports.

II.6.a. The Council passed the recommendation from COMC regarding Summer Meetings. For various reasons, such as expense, poor attendance, and a lack of willing organizers for scientific offerings, it was decided that there will be no Joint Summer Meeting in the present Mathfest format in the summers of '97, '98, and '99. In the year 2000 there will be a special AMS celebration in conjunction with the International Mathematical Union's World Mathemati-

cal Year 2000 activities, presently being organized by Felix Browder's committee.

As a transitional step toward the discontinuance of Summer Meetings, the AMS participated in the 1996 Mathfest. In fact, the Seattle Mathfest appeared to be better attended than some past Summer Meetings and included a varied and interesting program, with high-quality expository talks and some scientific sessions. Nevertheless, despite various cost-cutting measures, such as reducing the services offered, it was still an expensive meeting for the AMS, and problems arose from the lack of services.

II.6b. COMC has recommended that the AMS hold sessions for graduate students in order to increase the participation of younger mathematicians in meetings; this idea was tried at the Seattle Mathfest and appeared to be quite successful and popular.

II.6c. Special discussion groups for researchers participating in Special Sessions were proposed to encourage interaction between established mathematicians and younger mathematicians and underrepresented minorities; the first of these was planned for San Diego.

II.6d. Another idea was to encourage more interdisciplinary activities and discussion of diverse applications of mathematics at meetings. Two activities related to this were planned for the San Diego meeting: a panel discussion organized by Ruth Williams on "Careers for Mathematicians in Industry, Government, and Business" and a Special Session on the "Mathematics of Industry, Government, and Business", organized by Desiree Beck.

II.7. COMC has decided to cut its face-to-face meetings to one per year in order to reduce costs. The next meeting of COMC will be Saturday, September 20, 1997, in Chicago. The new chair of COMC will be Joel Spencer.

II.8. COMC is interested in members' concerns and ideas regarding its activities and regarding meetings and conferences in general. In particular, COMC welcomes comments regarding the topics mentioned here, especially regarding items currently under study, such as Sectional Meetings and the research appeal of National Meetings.

COMC will continue to seek input from various sources. A focus group discussion on National Meetings will be held at the January 1997 meeting in San Diego, with a randomly selected group of meeting participants. This is the fourth such focus group discussion.

The members of COMC as of November 1996 are: Roy Adler, Bettye Anne Case, John H. Ewing (ex-officio/AMS executive director), Robert Fossum (ex-officio/AMS secretary), Isom Herron, Evan Houston, Mac Hyman, Jerry Marsden, Cathleen S. Morawetz (ex-officio/AMS president), Frank Morgan, Deborah Sulsky, Sylvia Wiegand, and Ruth Williams.

Permanent invited guests: Robert Daverman (associate secretary, Southeastern Section), Susan Friedlander (associate secretary, Central Section), William Harris (associate secretary, Western Section), and Lesley Sibner (associate secretary, Northeastern Section).

AMS Staff: Hope Daly (staff support), Heather MacDonald (staff support), and James Maxwell (senior staff liaison).

This report was prepared by Sylvia Wiegand, chair of COMC, with the assistance of the Committee.

## Committee on the Profession (CoProf)

*Joseph Lipman, Chair*

### Meetings

CoProf held face-to-face meetings on 3/30-3/31/96 and 10/19-10/20/96. Additional business was conducted by e-mail.

### Rochester

Under the leadership of Salah Baouendi (whose term as chair ended February 1, 1996), CoProf was much involved in Society actions related to changes in the mathematics program at the University of Rochester: in the formulation of the January 1996 Council resolution, in communication with the mathematics department at Rochester, in solicitation of letters of support from the whole academic community, and in informing the community through personal contact and through articles in the *Notices* and in the *Chronicle of Higher Education*. (The Society's efforts, under the overall direction of President Cathleen Morawetz, were led by President-elect Arthur Jaffe and effectively supported by the Providence office, as well as by members of the Rochester Task Force and other volunteers.)

After the Rochester situation was resolved (see [www.ams.org/committee/profession/rochester/rochester.html](http://www.ams.org/committee/profession/rochester/rochester.html)), the Council approved CoProf's recommendation to continue the Rochester Task Force under the name Mathematics Advocacy Task Force, with the purpose of bringing together prominent representatives from mathematics, the sciences, technology, and business to publicize the role of mathematics in universities and in society at large.

What does the Rochester episode suggest about how mathematics departments can best function in a changing academic environment? CoProf is sponsoring a panel discussion, organized by Frank Gilfeather, on this question at the 1997 annual AMS meeting in San Diego. (Several other sessions on "survival" are scheduled for the same meeting.)

CoProf has begun discussing other ways in which the AMS might offer assistance to individual mathematics departments.

### Public Awareness

CoProf prepared a report on AMS activities in the area of public awareness (see [www.ams.org/committee/profession/pubaware.html](http://www.ams.org/committee/profession/pubaware.html)). This component of the mission of the AMS is too wide ranging for one policy committee to deal with in its entirety, and so the report concentrates on communication with the public at large, exclusive of JPBM activities such as "Mathematics Awareness Week". The report contains numerous recommendations, as well as a call for volunteers to help carry them out!

Following up on this report, CoProf established a Working Group on Public Awareness in Mathematics (WGPAM),

chaired by Steven Weintraub, to stimulate and serve as a focal point for public awareness efforts. WGPAM has created the “New-in-Math” e-MATH page, aimed at the general public ([www.ams.org/new-in-math/](http://www.ams.org/new-in-math/)). Though WGPAM is initially a subcommittee of CoProf, it is anticipated that it will develop into a more autonomous AMS entity.

### Employment

CoProf oversees the maintenance of employment- and career-related information on e-MATH ([www.ams.org/committee/profession/](http://www.ams.org/committee/profession/)).

CoProf sponsored a talk by Linda Thiel, director of the AMS-SIAM, Sloan Foundation-funded career information project ([www.ams.org/careers/](http://www.ams.org/careers/)), on “Nonacademic Career Opportunities in Mathematics” at the 1996 annual meeting in Orlando.

CoProf sponsored a three-hour program, organized by Annalisa Crannell, on “Preparing Ourselves and Our Students for Careers in Mathematics” at the 1996 Mathfest in Seattle. A video of the sessions is being distributed.

CoProf is sponsoring a panel, organized by Ruth Williams, on “Careers for Mathematicians in Industry, Government, and Business” at the 1997 annual meeting in San Diego.

### Professional Development

A newly formed Professional Development subcommittee is thinking about recommendations for activities in this area.

CoProf is co-sponsoring a panel, organized by Curtis Bennett, on “Continuing Professional Development” at the 1997 annual meeting in San Diego.

### Participation

Pursuant to Council approval in January 1995 of a CoProf resolution, the AMS established a Task Force on Participation for Underrepresented Minorities in Mathematics, chaired by James Turner. Major Task Force recommendations on the establishment of a Washington Office of Minority Affairs (joint with MAA and NCTM) and on bridge programs for beginning minority graduate students are on their way toward implementation.

### Relations with Other Disciplines

For the area of its 1997 review of AMS activities, CoProf has chosen “Relations with Other Disciplines”. (The two preceding reviews have been on Employment and Public Awareness.) A preliminary report will be discussed at the March 1997 CoProf meeting.

### Tenure, Adjuncts, ...

CoProf subcommittees are currently considering questions having to do with changing attitudes toward tenure and with the use of adjuncts, especially in the teaching of lower-level mathematics courses. These are large questions affecting all of academia. Any input from the membership on how the AMS might effectively influence the national debate would be most welcome. (Write to [coprof@ams.org](mailto:coprof@ams.org).)

## Committee on Science Policy (CSP)

*William James Lewis, Chair*

As 1996 began, the U.S. government was in its second shutdown in as many months, with serious impacts on the National Science Foundation and therefore on the institutions and individual mathematicians receiving NSF grant support. Moreover, there were grave concerns in the mathematical community about proposed budget cuts for FY97 and beyond. CSP, with the Washington Office and AMS leaders, worked to mobilize mathematicians to encourage Congress to support NSF and science funding. For the first time, an alert to all AMS members about the situation was issued by President Cathleen Morawetz. At the January Joint Mathematics Meetings in Orlando, William Harris (assistant director of NSF’s Mathematical and Physical Sciences Directorate) urged mathematicians to become more visible in the political process of funding for science. His speech, along with that of NSF director Neal Lane to the astronomers’ annual meeting, President Morawetz’s alert, and advice on contacting members of Congress were all posted on the Science Policy home page on the AMS Web site. Information was e-mailed to department chairs and the network of AMS members willing to contact members of critical congressional oversight committees.

Continuing the increased emphasis on congressional contacts, in February CSP members Jean Taylor, James Lewis, and Sam Rankin of the Washington Office participated with other scientific societies and industry representatives in a Congressional Visits Day, developing contacts and presenting a unified message on the importance of support for science. We continue to work to increase coordination with other sciences, both in monitoring and responding to congressional developments and in developing an ongoing and more vocal message.

At the Orlando meeting CSP organized two focus groups in order to provide to the NSF their opinions on establishing priorities for mathematical research. D. J. Lewis, director of the NSF’s Division of Mathematical Sciences, was present at these well-attended and lively discussions. CSP also invited a leading astronomer, John Bahcall, to participate in a panel discussion on establishing priorities for federal funding in the mathematical sciences. In his presentation Bahcall described the process used by astronomers to set priorities in their discipline.

Not until April did Congress pass FY96 appropriations, by which time the FY97 budget process was in full swing, and CSP members continued to receive information on developments and requests for action at sensitive times. JPBM requested help in support of DoD funding and the Eisenhower program; their alert was sent to CSP and our contact group, and President Morawetz wrote a letter of support to selected members of Congress. By June we were alerting the community that action was needed in support of the NSF’s FY97 budget; this activity intensified and continued over the summer until the bill was passed in Sep-

tember. During the presidential election process CSP received information of interest to the community.

At their May meeting CSP took advantage of contacts developed during the previous months and heard presentations on government relations from the American Chemical Society, American Institute of Physics, IBM, staff members of Congressional Science Committees and Administration (OSTP), in addition to discussions with NSF representatives on current and future developments of interest to the mathematical community.

Revision of the AMS National Policy Statement is being undertaken by the Federal Policy Agenda Subcommittee, who solicited input from the community in the spring and is working to identify issues of concern to mathematicians and to present a draft document of their findings to CSP and ultimately the Council.

At the Seattle Mathfest in August CSP again organized a focus group for mathematicians to comment on the NSF's recompetition for mathematics institutes. Although their invited speaker (Defense Secretary William Perry) was unable to attend, CSP is hopeful that future invitations will bear fruit.

The September CSP meeting provided a chance to reflect on the year's activities and plan strategies for increased visibility of mathematicians in the political process: proposed are 1) "grass roots" networks to function as resources for members of Congress, 2) briefings or lectures on Capital Hill for congressional staff, 3) identification of a "champion" for mathematics and science in Congress, and 4) more visits by CSP members to their members of Congress, both in Washington and home districts. Five-year projections of federal budgets are speculative; and CSP realizes that the need for ongoing monitoring of the budget process, feeding back crucial information to the mathematical community, and increased pressure on congressional appropriations committees are critical to the funding of mathematics.

CSP activities arranged for the Joint Mathematics Meetings in San Diego, January 1997, include invited addresses by Neal Lane, director, National Science Foundation, and Congressman George E. Brown Jr., ranking Democrat on the House Committee on Science and a long-time supporter of science. Also planned are focus groups on proposed changes to the NSF's merit review criteria and support for graduate students, a panel discussion on improving public awareness of mathematics, and a workshop (jointly organized with JPB) on how to meet with members of Congress.

Better communication on matters of science policy is being achieved through development of the Science Policy page on the e-MATH World Wide Web site, where reports on federal budget developments, announcements, and resources are available (URL is <http://www.ams.org/>).

# ANALYSIS

**Elliott H. Lieb**, Princeton University, NJ, and  
**Michael Loss**, Georgia Institute of Technology, Atlanta

Not simply another book on real analysis, this straightforward, hands-on text provides readers at all levels—from beginning students to practicing analysts—with the basic concepts and standard tools necessary to understand analytical methods and better apply them to research in a variety of areas.

Noted authorities Elliott Lieb and Michael Loss take readers quickly from basic topics to applications (many of them quite deep), incorporating only those results and constructions that work successfully in mathematics and its applications, while omitting typical textbook topics usually included for historical reasons or to achieve (sometimes unneeded) generality. *Analysis* includes all necessary definitions, proofs, explanations, examples, and exercises to bring the reader to a new level of understanding with a minimum of fuss, while at the same time doing so in a rigorous and pedagogical way.

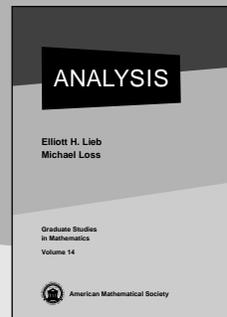
The authors take great care to include topics that any working analyst uses in everyday practice. Unlike other books on the topic, *Analysis* does not try to laboriously develop subjects from basic principles to full generality. Instead, the book immediately starts working with a subject and shows its relation to other mathematical concepts, illustrating how the corresponding notions work, how to apply them in practice, and more.

The book covers measure and integration, theory of  $L^p$  spaces, distribution theory, Fourier analysis, potential theory, and Sobolev spaces, and much more. Certain less standard topics (such as rearrangement, integral, and Sobolev inequalities) are included to give the reader a flavor of research in analysis and to emphasize the open, active nature of this area. To illustrate the use of mathematics developed in the book, the concluding chapter contains three examples of solving problems from the calculus of variations.

*Analysis* is a unique, practical book that everyone—from the graduate student, to the professional mathematician, to the physicist or engineer using analytical methods—will find interesting, stimulating, and useful.

**About the authors:** Elliott Lieb is Professor of Mathematics and Physics at Princeton University and is a member of the US, Austrian, and Danish Academies of Science. He is also the recipient of several prizes including the 1988 AMS/SIAM Birkhoff prize. Michael Loss is Professor of Mathematics at the Georgia Institute of Technology.

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