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MATHEMATICAL METHODS IN THE ATMOSPHERIC SCIENCES AND RELATED CO--ETC(U)
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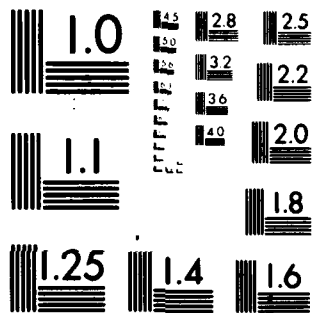
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FINAL CONFERENCE REPORT

The 1979 SIAM Fall Meeting was held in Denver, Colorado, on November 12-14. The registrants numbered 458 -- the highest number yet for a SIAM meeting. Forty-one states and twelve countries were represented.

PROGRAM

The program consisted of twelve invited lecturers, two von Karman prize recipients, and one hundred thirty-three contributed papers and poster presentations.

The program was organized into three symposia: Mathematical Methods in the Atmospheric Sciences, Computational Methods in Partial Differential Equations, and Adaptive Methods for Scientific Computation.

SYMPOSIA

I. The Symposium on Mathematical Methods in the Atmospheric Sciences was held on Monday, November 12. The atmospheric and related sciences provide an abundant source of problems in applied mathematics. Often problems in these areas are characterized by their extensive use of computing resources. Those attending realized they could make substantial contributions not only to the analysis of these problems, but also to the efficient use of computing in solving them.

The invited speakers were:

R.H. Kraichnan, Dublin, NH
"The Statistical Hydrodynamic Aspects of Turbulence"

C.E. Leith, NCAR
"Statistical Properties of Climate Systems"

E.N. Lorenz, MIT (Represented by R. Errico)
"Statistical Forecasting Methods"

M.B. McElroy, Harvard University
"Biogeochemical Cycles"

II. The Symposium on Computational Methods in Partial Differential Equations was held on Tuesday, November 13. This symposium focused attention on substantial recent advances. As computational methods improve, they also become more complex and difficult to implement. Therefore, software for partial differential equations is becoming more important, as it not only makes the new methods available, but also results in the increased efficiency of both people and computing resources.

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The invited speakers were:

B. Engquist, UCLA

"Software for Hyperbolic Partial Differential Equations"

D. Gottlieb, Tel-Aviv University

"Spectral Methods for Partial Differential Equations"

H.-O. Kreiss, CIT

Initialization Methods for Hyperbolic Partial Differential Equations"

O. B. Widlund, Courant Institute

"Capacitance Matrix Methods for Elliptic Partial Differential Equations"

III. The Symposium on Adaptive Methods was held on Wednesday, November 14. Adaptive methods in which the algorithm itself depends on intermediate computational results predate electronic computers. Adaptive methods are now state-of-the-art for many classic problems of numerical analysis, such as quadrature and ordinary differential equations. The use of adaptive methods is now being investigated for partial differential equations. Although quite complex, these methods yield an increase in efficiency and reliability. Problems involving adaptive methods are characterized by their extensive use of computing resources. Historically, the applied mathematician has contributed to both the analysis and the efficient use of these resources. Much work remains to be done.

The invited speakers were:

A. Brandt, Weizmann Institute

"Multi-grid Methods for Elliptic Partial Differential Equations"

J. Lyness, Argonne National Laboratory

"Adaptive Numerical Quadrature"

J. E. Oliger, Stanford University

"Adaptive Methods for Hyperbolic Partial Differential Equations"

V. Pereyra, Universidad Central de Venezuela

"Adaptive Methods for Two-Point Boundary Value Problems"

PRIZES

The Theodore von Karman Prize was awarded to George F. Carrier (Harvard University) and Joseph B. Keller (Stanford University). Professor Carrier presented a lecture entitled "More Grappling," and Professor Keller lectured on "Some Problems of Applied Mathematics."

Many favorable comments were received concerning the program and meeting. A strong spirit of cooperation and extensive communication existed among the attendees.

SOCIETY FOR INDUSTRIAL AND

Paul N. Swarztrauber
NCAR - Denver

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