

WOODS HOLE OCEANOGRAPHIC INSTITUTION

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The 1963 Summer Program of Theoretical Studies in
Geophysical Fluid Dynamics

by

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Final Report

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APPROVED FOR DISTRIBUTION

Bostwick H. Ketchum, Associate Director

1. Description of the program:

The program in Geophysical Fluid Dynamics for the summer of 1963 was a program of work, study and discussion and was formally outlined through two courses of lectures - one on the dynamics of rotating fluids, the other, a special lecture series on astrophysics. The twenty-three participants attempted to formulate and analyze tractable problems in geophysics and astrophysics. Some of the problems are "open-ended"; that is, they were begun during the summer, progress was reported at the end of the summer and the work is being continued at the individuals' respective institutions. Other problems were of more limited scope and served to introduce some of the younger participants to areas of inquiry.

2. Participants supported by the National Science Foundation

Grant:

Theodore D. Foster, M.A., Scripps Institution of Oceanography, La Jolla, California

Bernard St. Guily, Ph.D., Research Oceanographer, Laboratory of Oceanography, Museum of Natural History, Paris, France

Raymond Hide, Ph.D., Professor of Geophysics, Massachusetts Institute of Technology, Cambridge, Massachusetts

Louis N. Howard, Ph.D., Associate Professor of Mathematics, Massachusetts Institute of Technology, Cambridge, Massachusetts

Alan Ibbetson, B.Sc., Research Assistant, Massachusetts Institute of Technology, Cambridge, Massachusetts

Robert H. Kraichnan, Ph.D., Research Scientist,
Peterborough, New Hampshire

Paul H. LeBlond, B.Sc., Institute of Oceanography,
University of British Columbia, Vancouver,
Canada

Jia Ding Lin, Ph.D., Assistant Professor of Mathematics,
University of Connecticut, Storrs, Connecticut

Lorenz Maggaard, Ph.D., Kiel University, Kiel, Germany

Derek Moore, Ph.D., Lecturer, Department of Mathematics,
Bristol University, Bristol, England

Donald E. Osterbrock, Ph.D., Professor of Astrophysics,
University of Wisconsin, Madison, Wisconsin

Peter B. Rhines, Massachusetts Institute of Technology,
Cambridge, Massachusetts

Edward A. Spiegel, Ph.D., Research Scientist, Institute
for Mathematical Sciences, New York, New York

Robert Stein, B.Sc., Columbia University, New York, New
York

Henrikus Tinkelenberg, B.Sc., Massachusetts Institute of
Technology, Cambridge, Massachusetts

Alar Toomre, Ph.D., Assistant Professor of Mathematics,
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Massachusetts

Pierre Welander, Laborator, National Research Council,
Stockholm, Sweden

Participants supported by separate funds:

Robert A. Arnoldi, Ph.D., Research Laboratories, United
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Victor Barcion, Ph.D., Division of Applied Physics, Harvard
University, Cambridge, Massachusetts

Alan Faller, Ph.D., Woods Hole Oceanographic Institution,
Woods Hole, Massachusetts

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Steven Rosencrans, B.Sc., Department of Mathematics,
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Massachusetts Institute of Technology, Cambridge,
Massachusetts

Melvin E. Stern, Ph.D., Woods Hole Oceanographic Institution,
Woods Hole, Massachusetts

George Veronis, Ph.D., Woods Hole Oceanographic Institution,
Woods Hole, Massachusetts

3. Course Topics for 1963:

Dr. Derek W. Moore, the invited guest lecturer, gave a detailed report of investigations into the flow resulting from the motions of bodies through rotating fluids. His purpose was to probe deeply into one topic and thereby build a foundation for investigations into neighboring areas of study.

Dr. Donald Osterbrock presented a special lecture series on astrophysics. His discussion was meant to be an introductory survey of the more significant areas of current research in astrophysics.

A number of one-hour seminars were delivered during the program. These are listed in volume three of the detailed final report.

4. Student lectures:

At the end of the summer program eight National Science Foundation fellows and two independently-supported participants gave one-hour reports of their work. Written accounts of the work are reported in volume three.

All of the participants made a considerable effort to prepare a stimulating and original lecture.

5. Publication of the lectures and student research studies:

The notes of the summer course were taken by students assigned to each lecture. The edited version of these notes, the invited lecture series and the students' reports proved to be both a valuable record of the summer effort and a real contribution to geophysical fluid dynamics. They have been reproduced in three volumes and are available to interested persons.