

## PREFACE

Mixing and Stirring took place at the 1999 Geophysical Fluid Dynamics Summer Study Program. William R. Young (Scripps Institution of Oceanography) gave the principal lectures, with Ray Pierre-Humbert (the University of Chicago) adding two special lectures (only one was scheduled; the second was given at the request of the audience). These lectures served us an introduction to the general physical principles of the subject and its many applications in a large number of fields, and provided us with essential mathematical technology.

As usual, we had a variety of seminars throughout the weeks following the lectures, covering the many subjects in which mixing and stirring plays a role. Week 4, organized by Jim Ledwell (Woods Hole Oceanographic Institution) with great success, focussed the attention of the participants on the oceanic problem. Several visitors came to participate solely in this week, and we saw many familiar faces from past summers.

This year was also the 40th birthday of the Program. In celebration, the Oceanographic Institution graciously held a picnic for all the participants, for the people at Woods Hole connected to the Program, and for any fellows from previous summers that were able to visit for an afternoon. George Veronis gave a memorable speech with a historical perspective. The picnic ended with a customary sight - a GFD softball game - and the afternoon, thanks to W.H.O.I., was a very pleasant experience.

This year's fellows proved to be a group that meshed together especially well (including group triathlons each morning for the hardier fellows). Their academic accomplishments can be viewed elsewhere in this volume. One notable feature of their efforts is that they are all, pretty uniformly, commendable projects; sometimes, it has to be admitted that the program doesn't work for everyone, but this year, I think it worked as well as it could. Consequently, I think this summer was notably successful.

Special thanks go to Bill Young for his tireless efforts in preparing and giving the principal lectures, and for advising so many of the fellows. This summer could not have been so successful without Bill. Also, Eric Chassignet and Glenn Flierl spent many selfless hours with the computers, and Jack Whitehead dealt magnificently with many administrative matters throughout the whole year preceding the Program. Jean-Luc Thiffeault and Claudia Pasquero must be thanked for their important contributions to creating this volume.

And last, but by no means least, I thank W.H.O.I. Education, who continue to provide a perfect atmosphere in which to run the program. I specially thank Marcey Simon for all her efforts to organize the program, and our two staff assistants, Veta Green and Janet Fields, who stepped in to replace the veteran, Lee Campbell, when she moved off to other enterprises.

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Director