

## PREFACE

The symposium on Mechanics for Space Flight-1989 was held on November 30, December 1 and 2 of 1989 at the Institute of Space and Astronautical Science. This is one of the annual symposia which the Institute of Space and Astronautical Science sponsored. The subtitles of each day are as follows:

Nov. 30 Numerical Fluid Dynamics, Fluid Dynamics for Space Flight, Space Environmental Control Engineering

Dec. 1 Thermophysical Engineering, Thermofluid Dynamics, Heat Pipe Engineering

Dec. 2 Control Engineering for Space Exploration

Total of 34 papers were presented and discussed. Out of those presentations, the following 15 papers were selected and edited for this Proceedings. The editors are particularly appreciating for cooperation of those authors.

The Ministry of Education, Science and Culture of Japan has awarded a Grant-in-Aid for Scientific Research on Priority Area to "Numerical Fluid Dynamics" for fiscal years of 1987-1989. Several task groups for this purpose have been organized, and one of them, "Vortical Flow Study Group", has co-sponsored this Symposium. The papers No. 1 through 6 are the summarizing reports of the activities of this group.

Papers No. 7 to 10 are presented by the foreign scholars who were temporarily staying in our institute for research in Numerical Fluid Dynamics. Their cooperation has been greatly appreciated.

Rest of papers have concerned with thermophysics discussed on the second day. This is also co-sponsored by Japan Association for Heat Pipes. Their contribution is acknowledged with appreciation.

Prof. K. Oshima  
Editor