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## INTRODUCTION

In recent years, rapid progress has been made on the theoretical and observational descriptions of the distribution and physics of low-energy plasma in the earth's ionosphere and magnetosphere. Low-energy plasma observations from the Geos, ISEE, DS, APOD, EXOS, VIKING and other spacecraft from various countries have contributed important new observational information on the origin, transport, energization, and loss of low-energy plasma within the ionosphere-magnetosphere system. Similarly, increasingly sophisticated computer models of the dynamics of low-energy plasmas, such as for polar plasma outflow and the plasma-sheet tailing process, have made interesting and quantitative predictions of phenomena which may now be within reach of observational testing.

In order to assess the progress on low-energy plasma from both observational and theoretical perspectives, a symposium was convened on July 28 and 29, 1988 as part of the 4th Helsinki COSPAR meeting. Researchers from the Soviet Union, France, Japan, India, Czechoslovakia, the United States, Federal Republic of Germany, Sweden, England, Italy, Australia, Bulgaria and other countries presented their recent findings through a mix of invited and contributed talks. A majority of the presented talks were prepared as the publications which constitute the present volume. We have organized these proceedings into five chapters: 1. The Plasmasphere; 2. Polar Plasma Outflow; 3. Wave-particle Interactions; 4. The Ionosphere; and 5. Aurora and Magnetotail.

I am deeply grateful to the international program committee for their suggestions on speakers and sessions for this symposium. The program committee consisted of: Dr. C.R. Chappell (U.S.A.), Professor Y. S. Iyemori (France), Professor S. Nishida (Japan), Professor H. Balsiger (Netherlands) and Dr. M. Lockwood. I am also grateful to the session chairman and editors for the symposium. Serving as session chairmen were: Professors Decreau, A.P. Nagy, R.W. Schunk, N. Singh, and Dr. D.L. Gallagher and S.S. Sangalli. Editors were: Drs. K.O. Chandler, S.B. Idghal, D.L. Gallagher, J.H. Kosyra, and Professors Singh and Decreau. Finally, I am indebted to Mrs. Jo Paddycoart of the Center for Space Plasma and Aeronomy Research at UM for invaluable assistance in all phases of interaction with authors and in editing for this volume.