

## Preface

The present book is a collection of achievements of those who have been actively involved in computer simulation techniques in the field of space plasma physics. The new field of computer space plasma physics has been activated through the series of the International School for Space Simulations (ISSS), which was founded in 1981 at the General Assembly of URSI in Washington, USA, considering the importance of education of new comers into the field of computer experiments (computer simulation) of space plasmas, and the significance of information exchange of latest academic achievements in simulations as well as of related theory and space observations. The first ISSS was held in Kyoto, Japan in 1982 followed by the second ISSS in Hawaii, USA in 1985, and the third ISSS in Toulon and Nice, France in 1987.

The fourth ISSS (ISSS-4) was held in Kyoto (March 25-30, 1990) and in Nara (April 2-6, 1990). The first week was devoted to the extended training courses of several computer codes for space plasma simulations. About 50 UNIX work stations linked to faster multiple super-graphic computers (TAITAN's) were provided to the participants. The provided codes are contained in the present book.

The available codes evolved from the previous ES1 to two electromagnetic particle codes (KEMPO1 and TRISTAN), an MHD code and a hybrid code. Basic ideas and principles of more sophisticated codes such as a high-precision MHD code and a macro-scale electromagnetic particle code have also been explained at the ISSS-4 and are described in this book as well.

The ISSS-4 was the first attempt to release some of the existing particle codes which have been and are currently used for research. Until very recent days most simulation researchers have been reluctant to disclose the know-how and secrets of their own codes. On the other hand, some research works have been made by using a simulation code developed by other researchers(s) without knowing the details and limitations of the code. Such usage of codes as a black box may sometimes mislead to erroneous conclusion. The code release would definitely contribute to the establishment of a way of scientific reproducibility

of the published results of computer experiments (simulations). The editors and the authors of individual chapter of this book hope that this book will contribute to such healthy trend for space plasma physics.

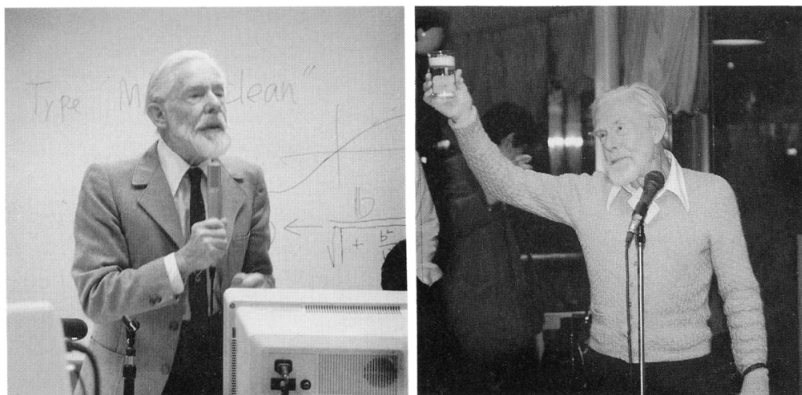
Finally we would like to express our hearty regret the Giant, Prof. Oscar Buneman passed away on January 24, 1993 before the completion of this book.

April, 1993

Hiroshi Matsumoto  
Yoshiharu Omura

### Oscar Buneman

Following a rigorous early education in the classical gymnasium in Hamburg and two years of university, Oscar Buneman moved to Manchester where he completed a further five years of studies in mathematics. During World War II he worked on the magnetron with the British Admiralty, on the calutron in Berkeley, and on reactor research in Canada. For ten years he was a lecturer in mathematics at Cambridge University and a fellow of Peterhouse college, working in close contact with D.R. Hartree and P.A.M. Dirac who were principal influences in his development. After moving to Stanford University, he started his active simulation research both in pure Plasma Physics and in Space Plasma Physics area. His contribution to the latter field cannot be expressed enough by any words. He will be much missed by colleagues and scientists in our field.



Oscar at ISSS-4