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Preface

The papers in this special issue are a subset of the papers presented at the Advanced Study Institute (ASI) on Space Storms and Space Weather Hazards held in Hersonissos, Crete, on June 19–29, 2000. The ASI was organized by the Institute for Space Applications and Remote Sensing of the National Observatory of Athens (NOA) and was attended by more than 130 participants from 26 countries. The meeting was held under the auspices of the NATO Scientific & Environmental Division, the European Space Agency (ESA), the Committee on Space Research (COSPAR), the International Association of Geomagnetism and Aeronomy (IAGA), the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), and the National Observatory of Athens.

The goals of the ASI were to provide a systematic overview and rigorous introduction to the physics of space storms; to review recent spacecraft measurements; to review space weather hazards associated with space storms and pertinent to the operations of technological systems in space and on ground; and to discuss and assess methods of space weather forecasting.

Space storms have a number of effects in geospace, i.e., the near-Earth space environment: global magnetic disturbances on the Earth surface, acceleration of charged particles in space, intensification of electric currents in space and in the ionosphere, and induced in the ground, impressive auroral displays, and many other phenomena both dramatic and subtle. The classical name "magnetic storms" arises from their effect with respect to the first area in the foregoing list that was also the first experimentally detected manifestation (by Alexander von Humboldt in 1806) of space storms.

The meeting was designed in such a way as to cover all aspects of space storm physics and space weather hazards. The papers in this volume cover issues such as:

- The physical processes leading to the eruption of solar coronal mass ejections (CMEs) and the propagation characteristics of CMEs through the interplanetary medium.
- The dynamics of the magnetospheric ring current.
- The astounding capability of the magnetosphere to rapidly accelerate charged particles to very high energies over relatively short times and distances.
- Space weather hazards at various altitudes from the Earth's surface to the edge of the magnetosphere.
- The advances in modeling of space storm impacts on terrestrial infrastructures such as power grids etc.
- The possible effects of space weather on tropospheric climate and weather.
- The advances and the novel techniques in space weather nowcasting and forecasting.

A companion publication of the present special JASTP issue is the monograph "Space Storms and Space Weather Hazards", appearing in October 2001 by Kluwer Academic Publishers and containing the tutorial lectures of the Advanced Study Institute.

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