Foreword

This book is the seventh volume in the series of books published within the framework of the European Research Course on Atmospheres ("ERCA"), the advanced international research course organized every year in Grenoble, France. This course was initiated in 1993 by the University Joseph Fourier of Grenoble, in order to provide PhD students and more senior scientists from Europe and the rest of the world with a multidisciplinary course which covers: the physics and chemistry of the Earth's atmosphere; the climate system and climate change; human dimensions of environmental change; and the physics and chemistry of other planets and satellites in the solar system and beyond. Since 1993, fourteen sessions have been attended by more than 700 participants from 50 countries, selected from a very large number of applications. The fifteenth session will take place from 8 January to 10 February 2007.

Each session lasts five weeks, which is considerably longer than most other research courses at this level. The first four weeks are devoted to a comprehensive programme of lectures (about 120 hours), seminars, panel discussions, poster sessions and visits to research institutes. The fifth week takes place at Observatoire de Haute Provence, South of Grenoble, where the participants learn about various instruments used for atmospheric measurements and Astronomy, as well as visiting the Cadarache Research Center of the French Atomic Energy Commission (International Themonuclear Experimental Reactor programme). There are fifty lecturers per session, amongst them many renowned specialists from Europe and North America, including Nobel Laureate Paul Crutzen.

This new volume contains twenty-six chapters dealing with a truly wide range of topics. After an introductory chapter on Earth System Science written by the Director of the International Geosphere-Biosphere Programme, Kevin Noone, the following subjects are covered: the exploration of Venus and the other planets of the solar system; water in the Earth's atmosphere; the West African monsoon; regional climate modelling; forcings and feedbacks by land ecosystem changes on climate change; atmospheric electricity and climate change; solar magnetic activity; the contribution of the Antarctic ice sheet to global sea level change; climate and atmospheric records from ice cores; biogeochemical processes in the ocean and at the ocean-atmosphere interface; novel organic pollutants in the marine environment; inorganic aerosol formation in the Earth's lower and upper atmosphere; Asian dust events; elemental speciation analysis; the use of aircraft for atmospheric measurements; Rayleigh temperature lidars; DIAL lidars for ozone measurements; optical telescopes; sustainable health in a globalised world; adaptation and mitigation to climate change in agriculture; and the communication of air pollution science to the public and politicians.

I wish to thank again the authors for kindly agreeing to write the chapters of this new volume. I am also very grateful to Michele Poinsot for her major contribution to the success of ERCA, and Isabelle Houlbert for editing the ERCA book series (with the help of "éclairs au café, à la vanille et au chocolat").

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