

# Preface

This volume presents a collection of selected articles based on presentations at the seventh edition of the International Summer School on Atmospheric and Oceanic Sciences (ISSAOS), annually organized by the University of L'Aquila, Italy. This seventh edition, held during September 4–7, 2007 in the amazing venue of the medieval Castle of the city of L'Aquila, focused on “Integrated Ground-Based Observing System Applications for Climate, Meteorology, and Civil Protection.”

The goal of ISSAOS 2007 was to bring together experts and young researchers in ground-based remote sensing to discuss the need for integrated systems and their contribution to a variety of applications, including weather forecast, meteorology, climatology, natural hazard monitoring, and transportation support.

Important questions related to weather, climate, etc., cannot be answered without a broad view of the atmospheric processes and their mutual links. Ground-based remote sensing provides useful tools to help understanding these processes by real measurements with known error characteristics. The user needs for ground-based remote sensing observations were reviewed at the first COST 720 workshop, incidentally held in L'Aquila in 2002. Of course, all observing systems have strengths and weakness, but none meet the breakthrough levels of user requirements for all aspects. The solution to these requirements could be best met by a composite of different observing systems.

The ISSAOS 2007-invited lecturers were Thomas Ackerman, Pier Paolo Alberoni, Paolo Antonelli, Stefania Argentini, Laura Bianco, Stefano Decesari, Piero Di Carlo, George L. Frederick, Frank S. Marzano, John Nash, Christian Pagé, Vincenzo Rizi, Herman Russchenberg, David D. Turner, and James M. Wilczak.

A total of 70 people from 10 countries and 4 continents participated in ISSAOS 2007. The primary audience was constituted by graduate students in remote sensing and atmospheric sciences, PhD students, and remote sensing researchers willing to broaden their view concerning ground-based instrumentation, their synergy, and applications. Following the tradition of ISSAOS, participants were asked to provide an evaluation of the school at its conclusions. The results indicate that generally the participants liked the school, including the quality of lecturers, the methodology, and the venue. The overall organization and the social program were especially appreciated by the vast majority.

The discussion during and following ISSAOS 2007 has been the starting point for the preparation of the contributions in the present volume. The first part reports a number of papers addressing the basic principles and the recent advances in ground-based remote sensing of the atmosphere. The second part of the book reviews a list of state-of-the-art applications of ground-based remote sensing integrated systems to the study of climate, weather, and natural hazards. Even though this volume is published after almost 3 years after the conclusion of ISSAOS 2007, it represents a valuable sample of the state-of-the-art on ground-based remote sensing technology and applications.

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Finally, this book inevitably carries signs of the tragic earthquake event in L'Aquila on April 6, 2009. Our most sincere thoughts go to the many that have lost lives and beloved ones during that tragic event.

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