International Association of Geodesy Symposia

Michael G . Sideris, Series Editor

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Symposium 101: Global and Regional Geodynamics
Symposium 102: Global Positioning System: An Overview
Symposium 103: Gravity, Gradiometry, and Gravimetry
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Geodesy for Planet Earth

Proceedings of the 2009
IAG Symposium,
Buenos Aires, Argentina,
31 August - 4 September 2009

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ISBN 978-3-642-20337-4 e-ISBN 978-3-642-20338-1
DOI 10.1007/978-3-642-20338-1
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2011941192

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

The International Association of Geodesy IAG2009 "Geodesy for Planet Earth" Scientific Assembly was held 31 August to 4 September 2009 in Buenos Aires, Argentina. The theme "Geodesy for Planet Earth" was selected to follow the International Year of Planet Earth 2007–2009 goals of utilizing the knowledge of the world's geoscientists to improve society for current and future generations. The International Year started in January 2007 and ran thru 2009 which coincided with the IAG2009 Scientific Assembly, one of the largest and most significant meetings of the Geodesy community held every 4 years.

The IAG2009 Scientific Assembly was organized into eight Sessions with Sub-Sessions in five of them. Four of the Sessions of IAG2009 were based on the IAG Structure (i.e. one per Commission) and covered Reference Frames, Gravity Field, Earth Rotation and Geodynamics, and Positioning and Applications. Since IAG2009 was taking place in the great Argentine city of Buenos Aires, a Session was devoted to the Geodesy of Latin America. A Session dedicated to the IAG's Global Geodetic Observing System (GGOS), the primary observing system focused on the multidisciplinary research being done in Geodesy that contributes to important societal issues such as monitoring global climate change and the environment. A Session on the IAG Services was also part of the Assembly detailing the important role they play in providing geodetic data, products, and analysis to the scientific community. A final Session devoted to the organizations ION, FIG, and ISPRS and their significant work in navigation and earth observation that complements the IAG. This volume contains the proceedings of the eight Sessions which are listed below:

Session 1: **Reference frames implementation for geosciences' applications: From local to global scales**
Convenors: Zuheir Altamimi, Claudio Brunini
Session 2: Gravity of the Planet Earth
Convenors: Yoichi Fukuda, Pieter Visser
- **Session – 2.1:** Physics and Geometry of Earth: Focus on satellite altimetry and InSAR
  Convenors: Cheinway Hwang, José Luis Vacaflor
- **Session – 2.2**: Gravity – An Earth Probing Tool: Focus on CHAMP/GRACE/GOCE missions, relative/absolute/superconducting gravimetry, and their applications
  Convenors: Roland Pail, Leonid F. Vitushkin

Session – 2.3: Modern Height Datum: Focus on definition and realization of GPS-levelling and gravity-base height datum
Convenors: Sílvio R.C. de Freitas, Dru A. Smith
Session – 2.4: Gravity and Geoid Modelling: Focus on global and regional gravity and geoid modelling
Convenors: Urs Marti, Yan Ming Wang

Session 3: Geodesy and Geodynamics: Global and Regional Scales
Convenors: Mike Bevis, Sylvain Bonvalot
Session – 3.1: Rotation of the Planet Earth
Convenors: Richard Gross, Rodrigo, Abarca del Rio
Session – 3.2: Sea level changes and post-glacial rebound
Convenors: Juan Fierro, Michael Bevis
Session – 3.3: Ocean loading and global water distribution / geophysical fluids
Convenors: Tonie van Dam, Richard Gross
Session – 3.4: Geodesy, crustal motions and geodynamic processes
Convenors: Juan Carlos Baez, Sylvain Bonvalot, Arturo Echalar
Session – 3.5: Geodesy and the near-field solid earth response to cryospheric mass changes
Convenors: Jim Davis, Gino Casassa

Session 4: Positioning and remote sensing of land, ocean and atmosphere
Convenors: Sandra Verhagen, Pawel Wielgosz
Session – 4.1: Technology and land applications
Convenors: Dorota Grejner-Brzezinska, Xiaoli Ding
Session – 4.2: Modelling and remote sensing of the atmosphere
Convenors: Marcelo Santos, Cathryn Mitchell, Jens Wickert
Session – 4.3: Multi-satellite ocean remote sensing
Convenors: Shuanggen Jin, Ole Baltazar Andersen

Session 5: Geodesy in Latin America
Convenors: Denizar Blitzkow, Claudia Tocho

Session 6: JOINT ION/FIG/ISPRS session on Navigation and Earth Observation
Convenors: Dorota Grejner-Brzezinska, Charles Toth
Session – 6.1: Navigation (FIG, ION)
Convener: Dorota Grejner-Brzezinska
Session – 6.2: Earth Observation (ISPRS)C
onvener: Charles Toth

Session 7: The Global Geodetic Observing System: Science and Applications
Convenors: Richard Gross, Hans-Peter Plag, Luiz Paulo Fortes
Session – 7.1: Past Progress and Future Plans
Convenors: Hans-Peter Plag, Richard Gross, Luiz Paulo Fortes
Session – 7.2: Science and Applications
Convenors: Richard Gross, Hans-Peter Plag, Luiz Paulo Fortes

Session 8: The IAG International Services and their role for Earth observation
Convenors: Ruth Neilan, Rene Forsberg

The number and quality of contributions for the eight Sessions clearly demonstrated the important and vital role that Geodesy plays in understanding the earth and its dynamical processes. Satellite, airborne, and terrestrial systems and networks are

continually measuring and analyzing the earth for global change. For this reason the name of these proceedings is "Geodesy for Planet Earth" which reflects the role four-dimensional geodesy plays in understanding the changes to Planet Earth.

The 2009 Assembly attracted nearly 500 oral and poster presentations from 370 geodesists from 45 countries and clearly shows the interest and importance of geodesy globally. The approximately 130 papers that are included in these proceedings (about 25% of the total) are intended to cover much of the latest research and projects on-going in the field.

These proceedings would not be possible without the tremendous work by the Convenors of each of the Sessions and Sub-Sessions. They devoted a enormous amount of time and energy in organizing the reviews and final acceptance of the papers for their Sessions. We are very grateful to IAG Secretary General Hermann Drewes and IAG President Michael Sideris for all their guidance and help with these proceedings. The Local Organizing Committee in Buenos Aires was invaluable in helping arrange a very memorable Assembly and provided essential support in the development of these proceedings. And lastly, sincere thanks go out to all the participating scientists and graduate students who made the IAG 2009 "Geodesy for Planet Earth" Scientific Assembly and these proceedings a tremendous success.

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