IAG Newsletter

June 2006

Editor: Gyula Tóth

IAG Communication and Outreach Branch
MTA-BME Research Group for Phys. Geod. and Geodyn.
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Information Service of the International Association of Geodesy | http://www.iag-aig.org | newsletter@iag-aig.org

Contents

The *IAG Newsletter* is under the editorial responsibility of the *Communication and Outreach Branch* (COB) of the IAG.

It is an open forum and contributors are welcome to send material (preferably in electronic form) to the IAG COB (newsletter@iag-aig.org). These contributions should complement information sent by IAG officials or by IAG symposia organizers (reports and announcements). The *IAG Newsletter* is published monthly. It is available in different formats from the IAG new internet site: http://www.iag-aig.org

Each *IAG Newsletter* includes several of the following topics:

I. news from the Bureau Members
II. general information
III. reports of IAG symposia
IV. reports by commissions, special commissions or study groups
V. symposia announcements
VI. book reviews
VII. fast bibliography

Books for review are the responsibility of:

C.C Tscherning
University of Copenhagen
Dept. of Geophysics
Copenhagen, Denmark
Fax: +45 35365357
E-mail: cct@gfy.ku.dk

General Announcements

Assistant/Associate Professor in Geodetic Earth Observation

The *Department of Geomatics Engineering*, in the Schulich School of Engineering at the University of Calgary, invites applications for the position of Assistant or Associate Professor (tenure track) in Geodetic Earth Observation, effective January 1, 2007. Applicants at the Assistant Professor level should have some post-doctoral, industrial, or equivalent experience to be considered. A PhD in science or engineering is required.

Demonstrated expertise in Earth systems monitoring by geodetic techniques is required. Research expertise in one or more of the following areas is desirable: satellite geodesy, satellite altimetry, space borne gravimetry and gradiometry, geodynamics, potential field modeling, geodetic applications of InSAR, and orbit determination methods. Experience with research and applications of dedicated gravity satellite missions, satellite altimetry missions and SAR missions will be an asset. The position is expected to interface with all related disciplines of geomatics engineering and will conduct both teaching and research in geodesy and related areas. The applicant is expected to develop a strong research program and should be capable of attracting external funding for these research activities and graduate student support. The selected candidate must also have the capability and the flexibility to teach undergraduate fundamental engineering courses and is expected to register as a Professional Engineer or Geoscientist in the Province of Alberta.

The Department of Geomatics Engineering is actively involved in all aspects of geomatics engineering and comprises 20 faculty members, some 90 graduate students and 50 students in each year of the undergraduate program. State-of-the-art geomatics engineering equipment and computer facilities are available. Related information can be found at http://www.geomatics.ucalgary.ca/

The University of Calgary is a co-educational, non-denominational, government supported institution with a student population of about 27,000. The City of Calgary itself has a population of over one million and is situated within an hour's drive of Banff National Park, one of the most beautiful parts of the Rocky Mountains.

Applications should include a detailed curriculum vitae and a complete list of publications. Three letters of reference should be mailed directly to:

Head, Department of Geomatics Engineering, Schulich School of Engineering
University of Calgary
2500 University Drive NW, Calgary, Alberta T2N 1N4, Canada
E-mail: minch@ucalgary.ca

Closing date: **September 15, 2006**
All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority.
The University of Calgary respects, appreciates and encourages diversity.
To see all University of Calgary academic positions, please visit www.ucalgary.ca/hr/career

Call for Proposal – Nominations open for IAG Secretary General

The present Secretary General, C.C. Tscherning, has served for 3 periods, and cannot be re-elected. The election of a new Secretary General (SG) will take place in the spring of 2007 together with the election of other officers for the 2007-2011 period.

The commitment associated with this position is heavier than that associated with any of the other IAG executive positions. The IAG executive committee has therefore decided to separate the election of the new Secretary General from the other nominations and elections, because the election is based on a call for proposals, which have to be evaluated by the IAG Executive.

The duties of the SG are described in the by-laws, section 2.5.3, as quoted below. Since the SG will also be the director of the Central Bureau, a nomination automatically implies a commitment to host the Bureau, as well.

According to the by-laws, the SG receives no salary, but the expenses of the SG may be covered by the allocation received from IUGG. However, the funds needed for these expenses have normally exceeded the IUGG allocation, so the organization hosting the SG and thereby the Central Bureau contributes to the travel expenses of the SG and the running of the Central Bureau.

The nominated SG should be prepared to spend at least 1 full day per week on IAG matters, and the Central Bureau hosting organization should provide secretarial assistance equivalent to 2 full days per week. A nomination should therefore include information about the degree to which the hosting organization is prepared to cover, in whole or in part, the expenses of the SG and of the Central Bureau.

The proposal should be submitted to the president of the Nominating Committee, Prof. F. Sansò in electronic form. Proposals may be submitted by the adhering bodies of the member countries, officers, fellows, and members of the Association. Candidates shall be asked to signify their acceptance of nomination and to prepare a resume (maximum 150 words) outlining their position, research interests and activities relating to the Association. The proposal should also state the preparedness to host the Central Bureau, and the financial and secretarial support which may be allocated.

Proposals should be submitted before September, 15, 2006.

Extract from By-Laws:

> **2.5.3** The **SECRETARY GENERAL,** shall have the following duties:
>
> a) Serve as secretary of the General Assembly, the Council, the Executive Committee and the Bureau; arrange for meetings of these bodies, distribute promptly the agenda and prepare and distribute the minutes of all their meetings.
> b) Director of the Central Bureau.
> c) Manage the affairs of the Association, attend to correspondence, and preserve the records.
> d) Circulate all appropriate information related to the Association.
> e) Prepare the reports of the Association's activities.
> f) Perform such other duties as may be assigned to him by the Bureau.

Address of Prof. Sansò:
Prof. Fernando Sansò
Politecnico di Milano - Polo Regionale di Como
via Valleggio, 11 I-22100 Como
Tel. +39.031.332.7518
Fax +39.031.332.7519, e-mail: fernando.sanso@polimi.it

Call for Nomination for IAG positions in the period 2007-2011

To the IAG National Correspondents, IAG Individual Members, IAG Officiers and IAG Fellows

Dear friends and colleagues,

after the Scientific Assembly of IAG in Cairns, our President Gerard Beutler, having taken advice from the Executive Committee (EC), has appointed a Nomination Committee (NC) to implement the procedure of elections of EC members, for the period 2007-2011.
The NC for these elections is composed by

L.P. Fortes (Brazil)
R. Rummel (Germany)
F. Sansò (Italy)
C.R. Wilson (USA)

The voting procedure, after the IAG By-Laws adopted in 2001 (http://www.iag-aig.org/index.php?tpl=text&id_c=43&id_t=19), will be carried out by Council members by mail and should be accomplished by the beginning of June 2007.
Votes will be expressed on a list of candidates, the compilation of which is the main duty of NC.
Such a list will be created in two steps:

Step 1: after the largest consultation of adhering bodies of the member countries, IAG officials, fellows and members, a preliminary list for all the available positions will be created, considering the most frequently suggested candidates;

Step 2: Council members will be informed of the preliminary list, so as to allow National Delegates to propose further candidates, according to the enclosed By-Laws. A final list is then created to be submitted to the vote of Council.

The positions to be filled in are the following:

Post	**Present holder**
IAG President	G. Beutler
IAG Vice-President	M. Sideris
Secretary General	C.C. Tscherning
President of Commission 1 (Reference Frames)	H. Drewes
President of Commission 2 (Gravity Field)	C. Jekeli
President of Commission 3 (Earth Rotation and Geodynamics)	V. Dehant
President of Commission 4 (Positioning and Applications)	C. Rizos
Members at large (2)	L.P. Fortes C. Merry
Service representatives (3)	R. Neilan M. Rothacher H. Schuh
President of Communication and Outreach Branch (COB)	J. Adam

Let us remember that President, Vice-President and Secretary General cannot be re-elected for the next period; in addition IAG By-Laws (1.2.1) claim "*Commission Presidents and Vice-Presidents shall serve in general for one four-year period. Re-elections are possible in exceptional cases*".
The procedure to nominate the Secretary General and the President of the COB involves a direct negotiation with supporting institutions and as such will be directly treated by the Bureau. The nomination of Service representatives will also follow a slightly different procedure involving consultation of Service bodies.
For all the other positions (President, Vice-President, 4 Commission Presidents and 2 Members at large), as a rule, at least 2 candidates should be proposed; for this reason we require to you to send to the following address

elena.raguzzoni@polimi.it

your nomination for one candidate for each post. Of course your list doesn't need to be complete, in case you prefer so. Your list has to be submitted not later than June 30, 2006. From all the nominations, the preliminary list with 2 candidates per post will be created.
Please consider that the new election procedure has several technical advantages, but specially it has a great value in that it raises the degree of internal democracy of the International Association of Geodesy.
The participation of all members to the fundamental choices of our Association is the unique fuel that can foster an increasing will of international cooperation in our scientific work, which seems to us an essential choice in these times of strong international competition.

So please send us your answer, also considering that it is not necessary to wait the last minute; be sure that we will be happy to follow your indications.

For the Nomination Committee, the Chair,

FERNANDO SANSÒ

IAG ELECTIONS 2007

NOMINATION FORM

by _____
(name of the nominator)

Post	**Name/Institution**
IAG President	
IAG Vice-President	
President of Commission 1 (Reference Frames)	
President of Commission 2 (Gravity Field)	
President of Commission 3 (Earth Rotation and Geodynamics)	
President of Commission 4 (Positioning and Applications)	
Members at large (2)	

Please fill in the proper fields and send the form to the following address:

elena.raguzzoni@polimi.it

An acknowledgement message will then be sent back to you.

Meeting Announcements

Symposium on Terrestrial Gravimetry: Static and Mobile Measurements

St. Petersburg, Russia, 20 - 22 August 2007.

The meeting is being organized by Leonid Vitushkin, Chair of the Study Group 2.1 (Comparison of Absolute Gravimeters) of Commission 2. The symposium is officially sponsored by the IAG, co-sponsored by the Institute of Earth Physics of the Russian Academy of Sciences, Moscow; and the BIPM.

The topics of the conference will include the design and investigations of the measuring instruments for the absolute and relative measurement of the gravity field, their applications for terrestrial, shipboard and airborne platforms, and in the metrology of gravimetry. Traditional free-fall, superconducting, and spring-type gravimeters, gradiometers, and new technologies, such as based on atom interferometry, will be especially welcome, as will results and methodologies of static and mobile campaigns, as well as current and future networks. Geophysical interpretation of results and connection with space-borne systems are of limited interest, since the emphasis is on terrestrial (including airborne) instrumentation and methods to extract gravity field measurements for a variety of applications.

More details about the symposium will soon be available on the website of the meeting. Contact person of the Local Organising Committee is Mrs. Margarita Grishina (mgrishina@eprib.ru).

CHRISTOPHER JEKELI AND
LEONID VITUSHKIN

International workshop on quality improvement and coast-land applications of satellite altimetry

An IAG Special Group 2.3 workshop on satellite altimetry
July 21-22, 2006, Beijing, China.

Organized by Chinese Academy of Surveying and Mapping, National Chiao Tung University, and Ohio State University.

Web site with meeting information: http://space.cv.nctu.edu.tw/altimetryworkshop/ALT2006.htm.

This workshop is dedicated to the problems and solutions of coast and land applications of satellite altimetry in such areas as coastal gravity field modeling, coastal circulations, river level and lake level monitoring and desert study using satellite altimetry. This workshop is part of the activities of Special Group 2.3, International Association of Geodesy. The scientific committee and local organizing committee welcome world scientists interested in the these topics to participate in this workshop. The participants of this workshop are also encouraged to attend the Western Pacific Geophysical Meeting, July 24-27, 2006, Beijing (http://www.agu.org/meetings/wp06) to extend the discussions in a related session. Themes of the workshop are:

- methods for improving quality of coastal altimetry data
- waveform retracking for altimetry
- shallow-water tides from altimetry
- coastal gravity field modeling with altimetry
- vertical datum connection using altimetry
- land applications of altimetry
- altimetry applications and problems in polar seas
- lake level and river level changes from altimetry
- coastal circulations from altimetry
- Applications of altimetry to desert study

Submit your abstract to Xiaotao Chang at changtao@public.bta.net.cn and Cheinway Hwang at hwang@geodesy.cv.nctu.edu.tw in the word format. The deadline is *April 30, 2006*.

Chairman of the Scientific Committee:
C. HWANG
National Chiao Tung University

First Announcement - 3rd International GOCE User Workshop

November 6-8, 2006, ESA-ESRIN, Frascati, Italy.

The European Space Agency's Gravity field and steady-state Ocean Circulation Explorer (GOCE) Mission is planned for launch in 2007. This, the first of ESA's Core Earth Explorer satellite missions, and promises amongst others scientific applications in Geodesy, Solid-Earth Physics and Oceanography.

This is a preliminary announcement of the ESA's intent to hold the third in a series of International GOCE User Workshops from 6-8 November, 2006 at ESA-ESRIN, in Frascati, near Rome, Italy. This pre-launch workshop is timed to take place prior to the closure of the forthcoming GOCE Data Announcement of Opportunity (see: http://eopi.esa.int). It is intended to provide potential users of GOCE data products with the opportunity to obtain the latest information on satellite performance as well as details regarding ground segment operations, data products and user services. It will allow users the opportunity to learn about product specifications, and the plans for data calibration and validation. This Workshop will also offer the opportunity for users to present their planned scientific studies, prior to consolidating their GOCE Data AO proposals.

Conference proceedings are anticipated to be published as an ESA Special Publication by the ESA Publications Division, and so full scientific papers are encouraged in addition to the Workshop presentation material. The official language of the workshop is English.

Preliminary Calendar of Key Dates

• First Announcement	March 2006
• Second Call & Web Announcement	May 2006
• Deadline for Abstract Submission	End June 2006
• Notification of Acceptance and Preliminary Program	September 2006
• Presentation Material for Proceedings	Mid October 2006
• GOCE User Workshop	November 6-8, 2006
• Deadline: Paper Submission for Proceedings	End November 2006

Further information on Workshop objectives and themes, as well as details for abstract and paper/poster submission, will be made available soon on the GOCE website:
http://www.esa.int/livingplanet/goce
and ultimately on the Workshop web site:
http://earth.esa.int/goce06

We look forward to welcoming you at the Workshop. Please do not hesitate to forward this announcement to colleague you believe may be interested.

The 3rd International GOCE User Workshop 2006 - Organising Committee

M. R. DRINKWATER
J. BENVENISTE
R. FLOBERGHAGEN
R. HAAGMANS
M. KERN

IAG Sponsored Meetings

IGeS Geoid School 2006. "The Determination and Use of the Geoid"

19-23 June, 2006, Copenhagen, Denmark

The new Geoid School 2006 will be organized in Copenhagen, Denmark. The Preliminary Program and the Registration Form are now available. For further information visit the IAG website http://www.iag-aig.org.

International workshop on quality improvement and coast-land applications of satellite altimetry

21-22 July 2006, Beijing, China
An IAG Special Group 2.3 workshop on satellite altimetry will be held from 21-22 July 2006, Beijing, China. This workshop is dedicated to the problems and solutions of coast and land applications of satellite altimetry in such areas as coastal gravity field modeling, coastal circulations, river level and lake level monitoring and desert study using satellite altimetry. The webpage of the workshop can be reached at the following URL: http://space.cv.nctu.edu.tw/altimetryworkshop/ALT2006.htm.

"Gravity Field of the Earth" – 1st International Symposium of the IGFS

28 August - 1 September 2006, Istanbul, Turkey
The 1st symposium of IGFS as being a continuation of the symposia series of the former International Gravity and Geoid Commission will be held in Istanbul, Turkey. The major objective is to bring together the geoscientists working in general areas of modeling the Earth's gravity field. For more information visit the website: www.igfs2006.org.

XIII Assembly of the Wegener project

4-7 September 2006, Nice, France
The 13th Assembly of WEGENER will provide a forum for discussion, coordination and scientific support for geoscientists interested in unravelling the kinematics and mechanisms of the broad Eurasian/African/Arabian collision zone. Details of the meeting are available: http://wegener.unice.fr/.

Geodetic Reference Frames GRF2006

9-13 October 2006, Munich, Germany
The Commission 1 „Reference Frames" of the International Association of Geodesy (IAG) invites scientists and experts from all countries to participate in the Symposium "Geodetic Reference Frames". The topics of the Symposium include the advanced development and combination of geodetic observation techniques, analysis and processing methods for parameter estimation related to reference frames, definition and integration of regional reference frames, consistent determination of terrestrial and celestial reference frames and Earth orientation parameters. Detailed information is available at the symposium website: http://iag.dgfi.badw.de/?grf2006.

Symposium on Terrestrial Gravimetry: Static and Mobile Measurements

20 - 22 August 2007, St. Petersburg, Russia.
The topics of the conference will include the design and investigations of the measuring instruments for the absolute and relative measurement of the gravity field, their applications for terrestrial, shipboard and airborne platforms, and in the metrology of gravimetry. Traditional free-fall, superconducting, and spring-type gravimeters, gradiometers, and new technologies, such as based on atom interferometry, will be especially welcome, as will results and methodologies of static and mobile campaigns, as well as current and future networks. More details about the symposium will soon be available on the website of the meeting.

IAG Related Meetings

UN/Zambia/ESA Regional Workshop on the Application of GNSS Technologies in Sub-Saharan Africa

June 26-30, 2006, Lusaka, Zambia
This Regional Workshop is hosted by the Ministry of Health on behalf of the Government of Republic of Zambia. The workshop will aim at initiating projects that benefit the Sub-Saharan African countries and strengthening the networking in the region. It will also address the areas of natural resources management and environmental monitoring by applying GNSS technologies to thematic mapping, forest management, water resources management, and habitat restoration.. All available information on this workshop is posted on the OOSA's website: http://www.unoosa.org/oosa/en/SAP/gnss/index.html.

Asia Oceania Geosciences Society's 3rd Annual Meeting (AOGS 2006)

July 10-14, 2006, Singapore, Malaysia
The AOGS mission is to promote geophysical science for the benefit of humanity in Asia and Oceania. Hence, AOGS 2006 will once again bring together geoscientists from all over Asia, Oceania and the rest of the world to present their works and ideas. AOGS invites all geoscientists to convene their own sessions and present their findings at AOGS 2006 in Singapore. For further details, visit http://www.asiaoceania-conference.org/.

3rd International conference on Cybernetics and Information Technologies, Systems and Applications

July 20-23, 2006, Orlando, Florida
CITSA '06 is an International Multi-Conference being organized with the purpose of providing researchers, practitioners, developers, consultants, and end-users of computerized, communications and/or control systems and technologies, as well as their industrial and social applications in the private and the public sectors, an opportunity to join in a common place sharing experience and knowledge. For details, please visit the conference website http://www.info-cybernetics.org/citsa2006/.

IAU Joint Discussion 16 at the XXVIth IAU General Assembly

August 22-23, 2006, Prague, Czech Republic
IAU Joint Discussion 16 entitled "Nomenclature, Precession and New Models in Fundamental Astronomy. Applications and scientific contribution to astronomy" will be held during the XXVIth IAU General Assembly, on 22 and 23 August 2006, in Prague. Please see the IAU GA scientific program at: http://www.astronomy2006.com/scientific-program.php and the JD16 web page at http://syrte.obspm.fr/iauJD16/.

ION GNSS 2006

September 26-29, 2006, Fort Worth, Texas
The Institute of Navigation (ION), hosts the ION GNSS 2006 technical meeting in September. For details, please visit http://www.ion.org/meetings/#gnss.

3rd International GOCE User Workshop

November 6-8, 2006, ESA-ESRIN, Frascati, Italy.
ESA's intent is to hold the third in a series of International GOCE User Workshops from 6-8 November, 2006 at ESA-ESRIN, in Frascati, near Rome, Italy. Further information on Workshop objectives and themes, as well as details for abstract and paper/poster submission, will be made available soon on the GOCE website: http://www.esa.int/livingplanet/goce and ultimately on the Workshop web site: http://earth.esa.int/goce06.

International Symposium on Advances in Geographic Information Systems – ACM-GIS 2006

November 10-11, 2006 Arlington, Virginia, USA
The 2006 International Symposium of ACM GIS will be the fourteenth of a series of symposia/workshops that began in 1993 with the aim of bringing together researchers, developers, users, and practitioners carrying out research and development in novel systems in which geospatial data and knowledge is central. Please visit the website http://www.itc.nl/acmgis06 for details.

125th Anniversary of Seismology in Hungary

November 13-14, 2006 Budapest, Hungary
The Permanent Seismological Commission was organised according to resolution of the Hungarian Geological Society of 9 November 1881. In the activity of the Commission took part the most prominent geologists, geographers and geophysicists of the country. Among them Radó Kövesligethy who made a lot to develop the theoretical backgrounds of seismology, organised the national network of earthquake observatories and was one of the founders of international collaboration in seismology.
To commemorate this anniversary of seismology in Hungary the Hungarian Academy of Sciences organises 13-14 November 2006 a meeting in the main building of the Hungarian Academy of Sciences (Budapest, Roosevelt square 9).
For more information contact please Péter Varga (varga@seismology.hu)

IAG Sister Societies' General Assemblies

IAU XXVIth General Assembly

August 14-25, 2006, Prague, Czech Republic
The XXVIth General Assembly of the International Astronomical Union (IAU) will be held in Prague, Czech Republic, in a city with a rich astronomical history going back to the middle of XIVth century, when the oldest central European university was established there. The webpage of the Assembly is http://www.astronomy2006.com.

FIG 2006

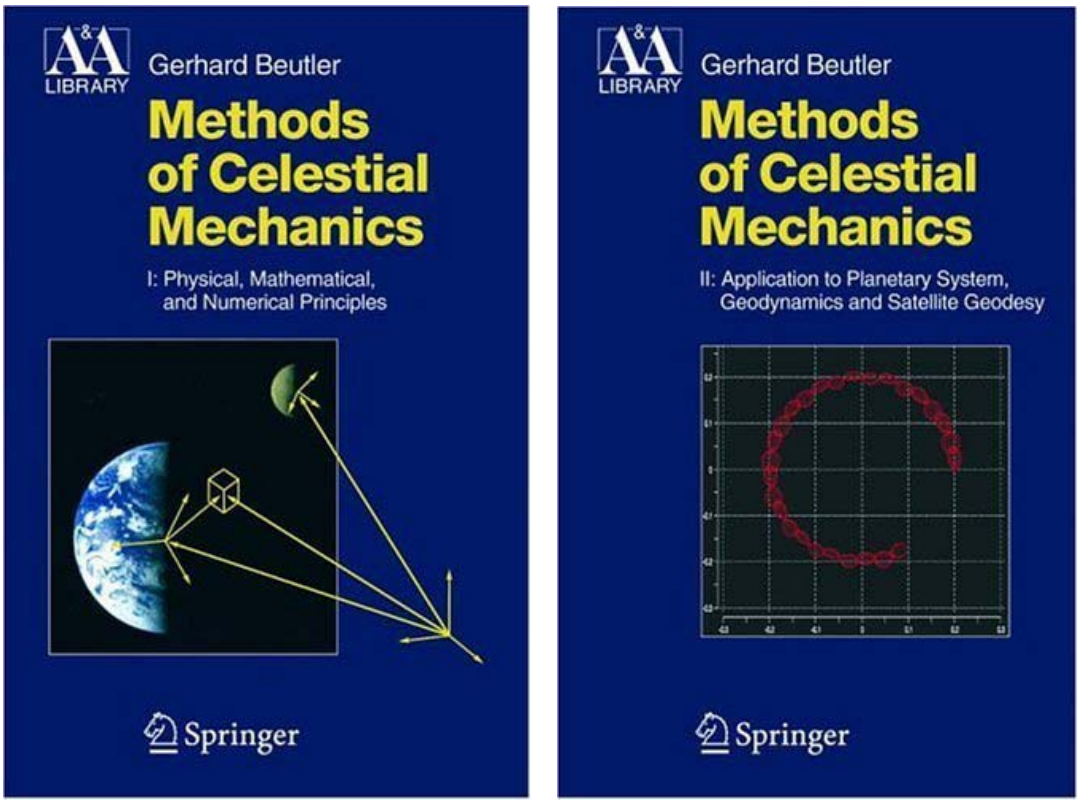
October 8-12, 2006, Munich, Germany
The Organising Committee has the pleasure of cordially inviting you to Munich to attend the XXIII International FIG World Congress from 8 to 13 October 2006. This event will take place concurrently with the INTERGEO 2006, the largest international congress and fair for geodesy, geo-information and land management. For details, please visit http://www.fig2006.de.

XIIIth ISM Congress

September 24-28, 2007, Budapest, Hungary
The XIIIth Congress of International Society for Mine Surveying (ISM) will be held at Budapest University of Technology and Economics, Budapest, Hungary. The preliminary program is available from the ISM website: http://www.ism.rwth-aachen.de.

Book Review

Gerhard Beutler: Methods of Celestial Mechanics



Title: Methods of Celestial Mechanics, Volumes I and II
Author: Gerhard Beutler

Publisher: Springer
ISBN: 3-540-40749-9/40750-2
Year: 2005
Price: Euro 86/86
Pages: 464/448
Size: 16 · 24 cm
Details: hard cover

The publication of the volumes “Methods of Celestial Mechanics, Volumes I and II” by Gerhard Beutler are a clear indication of today's relevance and vitality of the subject matter. It is proven that Celestial Mechanics is an essential discipline for the use and exploitation of artificial satellites and for a proper understanding of the evolution of our Solar System.

In recent years, a series of high-quality textbooks has been published that cover to a great extent similar topics. Examples of these text books are "Satellite Orbits, Models, Methods and Applications" by O. Montenbruck and E. Gill, published in 2000 (ISBN: 3-540-67280-X), and "Statistical Orbit Determination" by B.D. Tapley, B.E. Schutz and G.H. Born, published in 2004 (ISBN: 0-12-683630-2). Both these two books include exercises and can serve very well as reference for M.Sc. graduate students (and also Ph.D. students) that wish to specialize in orbital mechanics in general and precise orbit determination in particular, the first book containing also a CD-rom with source code that allows students to start their own developments.

Despite the existence of these high-quality textbooks, the author of "Methods of Celestial Mechanics" has succeeded in writing another very valuable textbook, which can serve as good teaching material. The author gives a very detailed and comprehensive overview of the many topics that are included in the field of Celestial Mechanics. Although the book does not include explicit exercises, it is larded with many examples and does come with a CD-rom with detailed instructions. The CD-rom allows easy installation in a Microsoft Windows environment and it can be used for hands-on training. It has to be remarked that the source code has not been included.

Volume I (also referred to as Part I of the two volumes) kicks off with a convenient summary indicating the rationale behind the structure of the volumes and their contents. The summary indicates that for introductory courses volume I might suffice. For those that want to have hands-on experience and insight in applications, volume II gives a nice overview.

Furthermore, volume I includes a historical overview with a nice perspective of space geodesy, going from optical (camera) to Doppler to VLBI to laser and radio-wave ranging systems. The consecutive chapters contain a very detailed treatment, both in words and in equations, of typical problems in celestial mechanics, ranging from the generic multi-body problem to the two-and three-body problem, and the motion of artificial satellites. Non-typical nice additions are for example the geodynamic equations for a non-rigid Earth and the equations for the attitude motion of a satellite.

The rest of volume I is used for a rigorous treatment and description of subjects crucial for understanding satellite motion and their precise positioning, such as variational equations, orbit perturbations (Lagrange Planetary Equations), numerical integration techniques and parameter estimation. This part is rather high-level and requires some perseverance from the reader. These chapters are, however, very valuable for specialists and proof the concept that if one wants to be at the forefront of Celestial Mechanics the concept "no pain, no gain" applies (necessarily) to some extent. Attention is paid to the perturbed motion and orbit determination of not only artificial satellites, but also planets in the Solar System.

Volume II starts with a nice recap of Volume I. In the first part (Part II of the two volumes), an overview is given of many applications for which Celestial Mechanics plays an important role. An appealing element forms the evolution of the motion of the planets in our Solar System. A very detailed and comprehensive overview is presented of everything associated with the rotation of the Earth and Moon, together with underlying physical phenomena (as induced by e.g. the Earth's atmosphere and oceans). In addition, detailed descriptions of perturbing forces acting on Earth orbiting satellites are given, both for gravitational and non-gravitational (atmospheric drag, solar radiation pressure, etc.) forces.

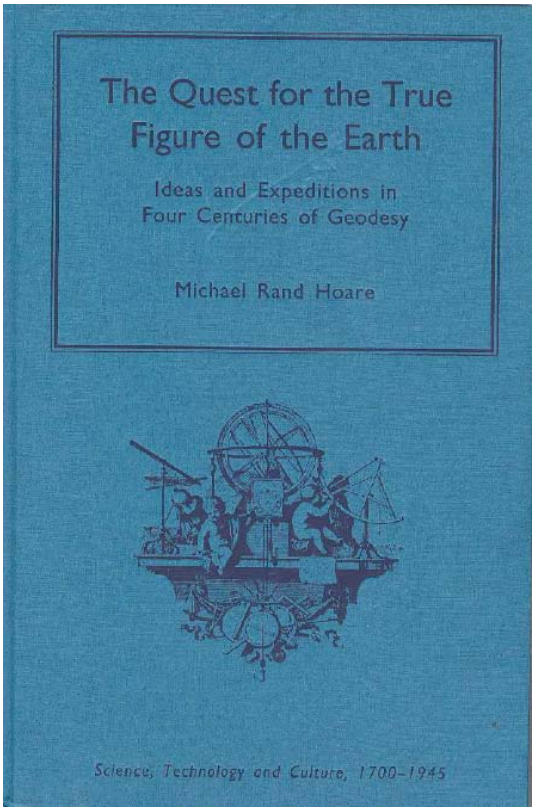
The second part (Part III of the two volumes) can be considered to be a detailed user manual for the CD-roms that come with the two books. As indicated above, the CD-roms are especially nice for obtaining hands-on experience and include clear descriptions of how to use the programs that are on them.

In conclusion, the two volumes are a valuable addition to the existing literature in the field of Celestial Mechanics in general and Precise Orbit Determination and associated applications in

particular. They can serve as textbooks for students (M.Sc./Ph.D.) and reference for scientists and specialists.

PIETER VISSER
Delft Institute of Earth Observation and Space Systems (DEOS)
Delft University of Technology/The Netherlands

Michael Rand Hoare: The Quest for the True Figure of the Earth



Title:	The Quest for the True Figure of the Earth, Ideas and expeditions in Four Century of Geodesy (in Science, Technology and Culture, 1700-1945, D.M. Knigth and T. Levere, Eds.)
Author:	Michael Rand Hoare
Publisher:	Ashgate, England
ISBN:	0754650200
Year:	2005
Price:	$94.95
Pages:	275
Size:	16 × 24 cm
Details:	hard cover

This book presents the scientific expeditions held by the French Academy of Science during the XVIIIth century aiming to unambiguously determine the actual shape of the Earth: oblate or prolate spheroid, pumpkin or rugby ball? These two expeditions put an end to the famous scientific controversy related to the Earth's flattening at the pole, confirming Isaac Newton's predictions by opposition to the Descartes' school in Paris, still reluctant to accept an "action at a distance".

This book addresses an audience of historians, geodesists but also clearly a much broader audience, thanks to its numerous illustrations, and clever use of notes per chapter and annex, allowing the author to tell this story, mixing complex scientific issues and controversies (specially between France and England), true adventures in remote and hostile countries as well as human courage and ingenuity. Both the scientific and the human aspects are addressed as one cannot go without the other. The book is also written in a way that allows either specialists or non-specialized readers to skip some parts without loosing the impetus of the story.

Most of the book relates to the expedition to Lapland (Maupertuis) and Peru (Godin). However, discussion is also provided on earlier aspects of geodesy as well as following similar surveys in France and in other parts of the world. The author explains why the shape of the Earth, which had far less practical consequences than the determination of longitudes at sea for example, generated such an excitement in the scientific and in general public during the French Enlightenment.

These expeditions experienced several difficulties since their very beginning: in Lapland, the harsh weather conditions imposing an almost impossible race against time and the mosquitoes in summer (fortunately not the bears!); in Peru: yellow fever or smallpox epidemic, climate in general, mosquitoes and snakes, and even Earthquakes, hostility from local people or lack of cooperation and lack of mutual trust between members of this expedition. Travels at this time were extremely difficult due to perilous navigation, pirates and wars and decisions should be made on-site as a letter could take up 6 months (one-way) to arrive to its final destination. These people risked their lives to explore new territories, not in search for gold, but for the sake of science.

Surprisingly, the famous scientific controversy did not end with the return of the first expedition (Lapland) as some people in Paris, still reluctant to abandon theories derived from Descartes, immediately questioned these results. Maupertuis ("the flattener of worlds and the Cassinis", as once wrote Voltaire) had some difficulties to prove his point and to justify his methods and results. It is clear that the author's personal researches in archives at the French Academy of Sciences and at the Paris Observatory and the synthesis he could derive helps the reader better understand the whole context of this epoch in France.

For readers more familiar with geodesy, this book is specially appealing because it does not only describe the human adventures related to these expeditions, as well as the famous scientists involved (Maupertuis, La Condamine, Clairaut, Bouguer,…) but it also addresses some technical issues not often discussed in historical literature: availability of new instruments (sectors), field procedures to limit systematic errors (limb calibration), data reduction and processing.

Finally, other attempts to measure the Earth's flattening are also discussed, as well as the definition of the meter, the adoption of the Greenwich meridian or the development of the least squares technique, leading to more modern geodesy. In this context, the author also briefly describes the establishment of the MittelEuropaische Gradmessung later leading to the creation of the International Association of Geodesy.

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