



November 2005

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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:

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General Announcements

Status and Progress of GGOS

GGOS Message Outline:

- Global Geodetic Observing System - Update
- Focus - Internal Organization and Finalization of the GGOS Implementation Plan
 - Website and communications
 - Request for WG Chairs to list WG members with contact information
 - Exploring a web forum for improving communications
- Integrated Global Observing System Partnership - Update on proposed theme 'Earth System Dynamics'
- GEOSS Activities
- Meetings - Steering Committee:
 - Thursday December 8, San Francisco during the AGU venue (5-9 Dec 2005)
 - TBD, in Vienna, during the EGU Venue (2-7 April 2006)
 - Plans for a GGOS workshop in October 2006, possibly in connection with FIG/IAG/INTERGEO

During the International Association of Geodesy 2005 meeting in Cairns, Australia, this past August, the IAG Executive Committee approved the continuation of its key program, the Global Geodetic Observing System (GGOS). During this meeting, the IAG appointed new chairs of the GGOS Steering Committee:

Prof. Markus Rothacher, Chair
Ruth Neilan, Co-Chair,
Prof. Hans-Peter Plag, Co-Chair

The chairs immediately met at Cairns, and have met via teleconference a number of times since, planning the next phases of this important activity. (Note that for more information on the IAG 2005 meeting, please visit the IAG website and see the message from IAG President Prof. Gerhard Beutler: http://www.iag-aig.org/index.php?tpl=text&id_c=6&id_t=244)

As we plan to assume the responsibilities for GGOS we acknowledge the important contributions and dedication since 2003 of GGOS Chair, Prof. Christoph Reigber and GGOS Secretariat Prof. Hermann Drewes. The draft implementation plan that was presented at Cairns captures the history and progress of GGOS and lays the framework for the next steps.

We have had quite a bit of discussion regarding how to keep pace with the rapid external developments that GGOS is involved in -Global Earth Observing System of Systems – GEOSS and Integrated Global Observing System Partnership – IGOS-P.

And importantly - how to proceed with our internal organization as we enter this next phase of truly realizing GGOS during the time period of 2005-2009.

To address the many issues of GGOS, a meeting of the Steering Committee (SC) and invited participants will be held on Thursday, December 8 in San Francisco from 14:00 to 17:00 at the AGU.

GGOS Internal Organization

The website is being updated and any comments are welcome for improvement: <http://www.ggos.org/>.

Current Working Group (WG) Chairs are requested to provide the listing of their WG members to the Chairs with email address. As GGOS moves forward, improving communications from the Chairs, across WGs and externally will be essential.

The chairs are reviewing the working document of the GGOS implementation plan and are proposing modifications to document for the upcoming period, these will be further reviewed by the Steering Committee and WG chairs. Any further suggestions from the WGs are invited. The current intent is to incorporate recent information, reflecting goals and objectives from the GEOSS and IGOS-P plans that are important for the global acceptance and realization of GGOS, ensuring that GGOS is an essential component which can make a clear and recognized contribution over the coming decade and beyond.

One of the topics will also be to work with the Services to establish links between the Service products and the scientific applications of these products by a diverse user community.

The chairs are also exploring the possibility of a web-based forum for GGOS as tool to evolve beyond simple e-mail structure as a method of communicating and making information readily available to a broader interest group. This would conceivably be partitioned between internal and external forums, as well as topical sub-forums.

Integrated Global Observing System Partnership

Prof. Hans-Peter Plag continues to be our key interface to the IGOS-P activity. Key points here are the upcoming IGOS-P-12bis meeting in London on 17 November and the IGOS-P Theme Leader meeting on 22 May 2006 in Geneva. For the 12bis meeting, the agenda includes a recommendation to commence the GGOS membership procedure and we expect that this point will be accepted without problems. Thus, after the 12bis meeting, the formal procedure for GGOS to become a full member of IGOS-P can be started. This will involve the exchange of Letters of Understanding between all IGOS-P members and GGOS.

Once this process has been started, we will also contact the chairs of the IGOS-P Themes and discuss with them the particular contribution of GGOS to these Themes. Considering that the IGOS-P Themes cover a wide range of problems, we will have to involve additional experts from the GGOS community in this processes.

At the IGOS-P Theme Leader Meeting in May 2006, we will discuss the suggested 'Earth System Dynamics' Theme with the other theme leaders. In order to detail the proposal further, a writing panel of 4 to 5 experts plus the chairs will work over the next months on the existing document. A key issue will be to document the added value of this new Theme and to show that the overlap with existing Themes is not too wide.

Our goal is to get the suggested Theme idea first accepted by the Theme Leaders and then a Theme proposal formally accepted by the IGOS-P-13bis meeting in November 2006. After that, the writing of the Theme report can start. For most Themes, this step involves/d some 20 experts. To see examples of Theme reports - see: <http://www.igospartners.org/Theme.htm>.

The Geohazards Theme Report does reference a number of observation techniques of the IAG and hence GGOS, and so does the Water Cycle report. A number of the other themes also depend on GGOS observations, while, of course, most Themes are users of ITRF.

GEOSS Activities & GGOS

The Group on Earth Observations (GEO) will convene the GEO-II plenary meeting 14 & 15 December in Geneva on the Global Earth Observing System of Systems (GEOSS). For information see the following sites, <http://earthobservations.org/default.asp>, <http://iwgeo.ssc.nasa.gov/>.

And please take note of the Ten-Year Implementation Plan document – this document will be used to highlight GGOS contributions to the negotiated plan, coordinating the GGOS implementation with the GEOSS implementation and target goals.

For an update on the GEO plenary and establishment of the GEO secretariat at the WMO in Geneva see this link: http://europa.eu.int/comm/research/environment/newsanddoc/article_2486_en.htm

One of the deliberations within the SC will be - what does GGOS want to contribute to GEOSS? The GEOSS implementation plan is built around the nine social benefit areas identified by the Second Earth Observation Summit, and clearly, GGOS is essential to a number of these. The plan includes the following statement as a preamble to the benefit areas:

4.1 Societal Benefit Areas

GEOSS will yield advances in the societal benefit areas defined by its purpose and scope. Each area has compelling reasons for the Earth-observation advances envisioned in GEOSS.

For information needs common to many societal benefit areas, GEOSS will facilitate the development and provision of common products such as maps of topography, bathymetry, river systems, infrastructure, and land cover and land use, and a geodetic reference frame for Earth observation. Interpretation and use of Earth observations requires information on the drivers and consequences of change, including georeferenced socio-economic data and indicators.

The plan can be accessed at the GEO site above, but here is a direct link:

[http://earthobservation.org/docs/GEOSS%2010-Year%20Implementation%20Plan%20\(GEO%201000\).pdf](http://earthobservation.org/docs/GEOSS%2010-Year%20Implementation%20Plan%20(GEO%201000).pdf)

The SC will be assessing the GEO plan and looking at harmonizing our structure and activities to be synergistic with both GEO activities and IGOS-P.

The SC will review the status of GGOS appointments to the GEOSS Working Groups and evaluate how best to interface and maintain support.

Meetings

The first meeting of the SC with extended participants and the chairs is called for December 8 as noted above. There is much business to address and attendees are requested to do some homework on these activities to enhance the discussion time, which is limited to 3 hours. The chairs feel that it is important to fully establish the new organization. The Science Advisory Council must also be in place in the very near future to assist with guidance of GGOS directions and plans.

During the EGU in Vienna (2-7 April 2006), a second meeting will be organized with the aim to further our internal organization and schedule of events. Discussion will also be centered on a GGOS workshop, possibly in connection with the FIG/IAG/INTERGEO symposium in Munich next October.

With kindest regards to our colleagues, and any suggestions can be directed to the Chairs, with assistance from Katrin Gundrum, acting Secretariat for the GGOS Chairs.

PROF. MARKUS ROTHACHER, CHAIR
and
RUTH NEILAN AND PROF. HANS-PETER PLAG, CO-CHAIRS
KATRIN GUNDRUM, GGOS CHAIR'S SECRETARIAT
(based on IERS Message No.77)
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Meeting Announcements

IAG Sponsored Meetings

Fifteen Years of Progress in Radar Altimetry Symposium

13-18 March 2006, Venice, Italy

Fifteen years after the launch of ERS-1 and TOPEX/POSEIDON, the European Space Agency, in collaboration with the French Space Agency, CNES, is organising an exceptional Symposium on “15 Years of Progress in Radar Altimetry”. For further information visit the website <http://www.esa.int/venice06>.

3rd IAG Symposium on Geodesy for Geotechnical and Structural Engineering and 12th FIG Symposium on Deformation Measurements

22-24 May, 2006, Baden, Austria

The FIG symposia on deformation measurements and analysis have a long tradition dated back to 1975. The IAG Symposium was established in 1998 and held twice. It will be the first time that the two symposia will be held together as a joint conference. Researchers, engineers, educators, designers, manufacturers, contractors, public authorities, and other professionals are cordially invited to attend this international event. Please also visit the symposium website for further details: <http://info.tuwien.ac.at/ingeo/sc4/baden>.

VI Hotine-Marussi Symposium of Theoretical and Computational Geodesy: Challenge and Role of Modern Geodesy

29 May - 2 June 2006, Wuhan University, PR China

The symposium will be held at Wuhan University, PR China, 29 May - 2 June 2006. More information will be circulated as soon as available and can be found at the website: http://www.sgg.whu.edu.cn/icct_hm.html

“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.

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 symposium shall give the opportunity to present new ideas, discuss improved models and approaches, and report on latest results of the definition and realization of geodetic reference frames. Detailed information is available at the symposium website: <http://iag.dgfi.badw.de/?grf2006>.

IAG Related Meetings

The International Symposium on GPS/GNSS 2005 (GNSS2005)

8-10 December 2005, Hong Kong

The International Symposium on GPS/GNSS 2005 (GNSS2005) will take place in Hong Kong, 8-10 December 2005. The symposium will feature a session of presentations from the Civil GPS Service Interface Committee (CGSIC). For details, please visit the following URL: <http://www.lsgu.polyu.edu.hk/GNSS2005/>.

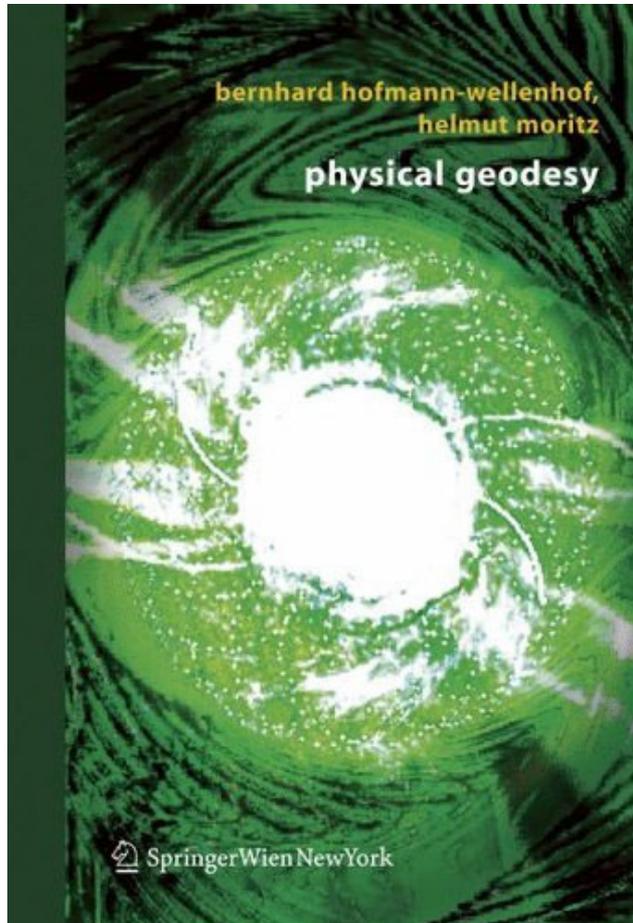
4th IVS General Meeting

January 9-13, 2006, Concepción, Chile

The fourth General Meeting of the International VLBI Service for Geodesy and Astrometry (IVS) will be held January 9-13, 2006, in Concepción, Chile. The purpose of the meeting is to assemble representatives from all IVS components to share information, hear reports, and plan future activities. The meeting also provides a forum for interaction with other members of the VLBI and Earth science communities. For further details visit the webpage <http://ivscc.gsfc.nasa.gov/meetings/gm2006>.

Book Review

Bernhard Hofmann-Wellenhof, Helmut Moritz: Physical Geodesy



Title: Physical Geodesy
Author: Bernhard Hofmann-Wellenhof, Helmut Moritz
Publisher: Springer Verlag, Wien
ISBN: 3211235841
Year: 2005
Price: US\$79.95
Pages: 403
Details: Paperback

This book is a new and re-written edition of the classic text with the same title by W.A. Heiskanen and H. Moritz, now almost 40 years old, but as fundamental today as then (except for some numerical applications); it is referred to as H&M1967 in the following. The new text is a mini tour de force in geodesy that covers not just physical geodesy but touches also on a variety of related topics, including geometric geodesy (datums and reference systems), satellite geodesy (orbital elements and perturbation theory), GPS (the system and basic theory), least-squares collocation (some principles and applications), and current activities (satellite gravity missions, geoid on the internet).

Nostalgic readers will be pleased to find the first four chapters of H&M1967 almost intact, virtually word for word, but will be disappointed that the more fundamental aspects of potential theory, such as Green's identities and integral formulas, and layer potentials and their discontinuities are missing. Also missing are corrections to some anachronisms in H&M1967, minor ones such as continuing to misname the center of mass as the center of gravity, or omitting exact formulas for the

normal gravity at altitude. There are also major, regrettable omissions of modern geoid computation – the FFT methods, e.g. (the old template methods are still there, dusty as ever). Discussion of the Mean Earth Ellipsoid is deferred until Chapter 5 in connection with the best-fitting Earth ellipsoid; that the part in Chapter 2 of H&M1967 was deleted is unfortunate. On the other hand, Stokes’s formula is now not burdened with alternative yet useless formalisms that incorporate constants in different ways. Also included in the new version is Hotine’s integral formula based on gravity disturbances as boundary values (it is given the less popular name, Koch’s formula, in the new text, despite its namesake coming after Hotine’s *Mathematical Geodesy*; the authors’ explanations notwithstanding). The chapter on gravity reductions could have used a revision. Helmert’s condensation method, now almost universally applied (knowingly or not), again receives only minor mention even though the geodetic literature over the past decade(s) is replete with articles promoting and discussing the theoretical aspects of this technique (and containing even some interesting controversy). There is a short, but urgently needed section on the remove-restore technique, although almost as an afterthought at the end of the book. Unfortunately, it is couched in least-squares collocation rather than standing on its own as a technique applicable to any type of practical evaluation of global integrals.

While the first four chapters were largely kept unchanged, Chapters 5-11 of the new *Physical Geodesy* are a mix of old and new, following their predecessors in tying relevant and modern geodetic topics to classical physical geodesy. Chapter 5 on the geometry of the Earth re-organizes and modernizes the old “Astrogeodetic Methods”, connecting it mostly to GPS rather than astronomic observations. The overview of GPS is taken mostly from another book by the first author. Other topics include pure geometry – coordinate transformation, ellipsoidal coordinates (now unfortunately with different notation than in Chapter 1), and geodetic datum transformations with differential formulas. Three-dimensional geodesy is briefly and correctly treated with GPS as background. Astrogeodetic methods nevertheless are not forsaken and this chapter includes almost all parts of the classic version with some minor exceptions. There are a few updates here, such as (among others) a discussion of WGS84 and transformations to local geodetic systems, a new polar motion figure, and a brief discussion on the “misuse of Laplace’s equation”.

Chapter 6 is again mostly identical (verbatim) to its predecessor (leaving out the rarely, if ever, used coating method to obtain gravity disturbances from gravity anomalies and geoid heights); also much of the numerical consideration (template method) in evaluating integrals is omitted. Chapter 7 is a more significant departure from the earlier text and is devoted more explicitly to satellite methods, though much on spherical harmonic determination is taken from the H&M1967 chapter on “Celestial Methods” (were there no new developments since the 1960’s?). The new text perfunctorily mentions satellite altimetry and falls notably short of providing a useful treatment and review of the tremendous impact this technology has had on gravity modeling. The new gravity missions are prominently featured, though more from a descriptive than an analytic standpoint (only some observation equations are provided for the GOCE mission).

Chapter 8 on Molodensky’s theory blends the material in the classic text with the developments by the second author in his equally famous *Advanced Physical Geodesy*. Only the analytic continuation method is discussed here, while the fundamentals of integral equation solutions have been omitted. There is now also a second part on astrogeodetic methods (which might have a better place in Chapter 5) and a discussion of the “meaning of the geoid”, although its connection to a global vertical datum is essentially missing.

The ninth chapter is on statistical methods (mirroring the seventh chapter in H&M1967). Again, there are minor updates, such as providing the Tscherning-Rapp covariance model (being perhaps the most popular, yet hardly the most accurate in many instances). The influence of distant zones is completely omitted, which is unfortunate, considering the wealth of literature that exists on the modification of Stokes’s kernel. Chapter 10 very briefly reviews least-squares collocation, taken from the second author’s advanced text; and the final chapter adds a few remarks on some computational methods.

It is difficult to re-write a classic in physical geodesy, especially when the parent field, geodesy, has undergone such a profound transformation in view of satellite methods. The authors have made a credibly valiant attempt, though one might have advised them to start from scratch rather than attempt to mirror the old model. The emphasis on GPS was probably not necessary, and the omission of FFT methods as well as a more rigorous remove-restore discussion with kernel modification is surprising, to say the least. These are such well known and practiced techniques that any book on physical geodesy should now include these thoroughly.

This reviewer naturally contrasted the new text with the old one, which was perhaps a bit unfair, but should hardly be unexpected considering the approach taken in the new version, where about 70% is exactly replicated from the old text. In several respects the new Physical Geodesy is a collage of several existing texts. This tends to obfuscate the continuity and focus one would expect in a modern text on this subject. At a minimum, a better organization of the chapters (and their contents) would have improved the flow from elementary to advanced topics, from theory to application. The new H&M is nevertheless a reasonable, if incomplete compendium of many classic and some modern aspects of physical geodesy, with a good measure of more general geodesy thrown in for free.

CHRIS JEKELI
31 October 2005

Irene K. Fischer : Geodesy? What's That?

My Personal Involvement in the Age-Old Quest for the Size and Shape of the Earth (with a Running Commentary on Life in a Government Research Office)



Title: Geodesy? What's That?
Author: Fischer, Irene K.
Publisher: iUniverse, Inc, New York
ISBN: 0-5958-0834-4
Year: 2005
Price: US\$25.95
Pages: 400
Details: Paperback

This memoir is well named. The word "Geodesy" is not widely known in the United States. If you say you are a geodesist to an American who isn't one, he or she will think you said "geologist" or "geneticist." Many Americans will admit to having heard of the Coast and Geodetic Survey, but they will have no idea what it did.

Irene K. Fischer spent 25 years (from 1952 to 1977) as a research geodesist at the agency which was named the Army Map Service when she joined it, but was subsequently renamed the US Army Topographic Command and then the Defense Mapping Agency Topographic Center (and is now the National Geospatial-Intelligence Agency). During that career she was continually answering the question posed in this book's title. The military officers in charge stayed for only a fixed tour of duty, so there was always someone new for whom the question had to be answered.

This is an amazingly rich and detailed story. She discusses all the geodetic projects she worked on and directed, but stops short of including any mathematics. The reader will come away with an understanding of the importance of these projects.

The reader will also learn of a time when computations were done with desk calculators and humans were intimately familiar with every number involved in the calculations. Data relevant to the figure of the Earth was scarce. Thus we read about days spent tracking down the cause of a single outlier in a set of deflections of the vertical. The cause turns out to be a subtle mistake in the identification of the point, a type of mistake that continues to plague computations today.

This is also a very personal memoir, and many names are mentioned. The dominant theme is the trial and tribulations the author experienced working with the bureaucrats. Every international meeting raised the issue of whether she should be allowed to attend. There were instances when her attendance was encouraged and then cancelled at the last minute, and there were instances when she had to pay travel costs herself. Every manuscript prepared for publication had to be cleared by those same bureaucrats who had little idea of what geodesy was about. This book lists 122 publications authored by Fischer, and from the text it seems that almost every one of them encountered some problem in the clearance process.

When reading about her frustrations, one wonders why she put up with the need to spend so much time dealing with people who had little or no idea what she was doing. All the people who had made her work enjoyable at the beginning of her career soon left for other, more hospitable, agencies. Why did she not follow them? There seem to be many answers: partly she was just too engrossed in her work to look for a position elsewhere. But also she was able to step back and see some amusement in the antics of the bureaucrats.

A characteristic of Irene Fischer's writing is her ability to have fun with her subject. This was especially apparent to the many students who have used her pamphlet *Basic Geodesy*, in which she compares the shape of the earth to various fruits and vegetables, including a grapefruit, a pear, and a potato. This same ability to have fun is also present in this memoir, in which she finds humor rather than bitterness in her endless struggles with bureaucrats. It is this ability to see the bright side that makes this memoir enjoyable and instructive reading.

CHARLES R. SCHWARZ
Bethesda, Maryland