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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. general information
- II. reports of IAG symposia
- III. reports by commissions, special commissions or study groups
- IV. symposia announcements
- V. book reviews
- VI. fast bibliography

Books for review are the responsibility of:

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General Announcements

New IAG internet site

IAG has got a new homepage. Please change your browser to <http://www.iag-aig.org> which contains the new updated IAG web pages and the most recent information.

Struve Geodetic Arc

A submission to UNESCO to be inscribed as a World Heritage Monument (press release)

The International Institution for the History of Surveying and Measurement - an Organisation within the International Federation of Surveyors (FIG) - is proud to announce that on 28 January 2004 a dossier, together with a letter from the Finnish Minister of Culture, Mrs Tanja Karpela, was submitted to the World Heritage Committee of UNESCO for the possible inscription of selected surviving survey stations of the Struve Geodetic Arc as a World Heritage Monument. This was done by the Government of Finland on behalf of the Governments of the ten countries through which the meridian arc passes, i.e. the Governments of Norway, Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Belarus, Moldova and the Ukraine representing their National Survey Departments.

The Struve Geodetic Arc was measured over the 40 years from 1816 to 1855 and stretches from Fuglenaes near North Cape in Norway (latitude 70° 40' 11"N) to near Izmail on the Black Sea (latitude 45° 20' 03"N). A distance of 2820 km or 25° 20' 08" of arc. In longitude the 265 stations lie between 22° 30' and 30° E.

Actually 34 of the surviving station marks have been selected for the present submission and these lie in ten different countries in today's geography (see above). The idea to seek a declaration to preserve a selection of the remaining Struve Arc points as a World Heritage site was originally presented by Aarne Veriö at a Scientific Conference in Tartu in 1993 where a Resolution was made. A corresponding Resolution proposed by Seppo Härmälä was then made at the FIG Congress in Melbourne in 1994 and the work to get all the necessary material together from these countries was initiated by Jan de Graeve and Jim Smith of the I.I.H.S.M. It gathered pace during the latter five years particularly with the help of Vitali Kaptjug from Russia. For the last 1½ years the Survey of Finland under Surveyor General Jarmo Ratia and his colleague Pekka Tättilä took over the task of assembling, collating, checking and reproducing all the documentation for the final submission document. However the whole project would not have been possible without the exceptional and unstinting support of the survey organisations and appropriate government departments in all the countries named above.

It is understood that it might be June 2005 before a decision is known but aside from that the project has graphically illustrated how surveyors and their political masters across ten countries can cooperate on a scheme of this sort. In fact it is the first such multi-country, cross border submission of a project and of a scientific nature which in itself meant that there was little by way of a precedent to follow.

As the first multi-country meridian arc it was a great step forward and it was not initially planned as one system. F G W Struve was working to the north whilst initially unbeknown to him a Russian military officer Carl F de Tenner was operating in a similar manner to the south. When it was decided to link up it was not a simple case of observing a common triangle as there were problems of reconciling two different units of measurement, the different instrumentation used and the political goodwill between the countries involved.

In the late 1800s David Gill in S Africa was starting out on a similar arc that would eventually go from Buffelsfontein near Port Elizabeth right through E Africa to near Cairo. He had the notion that this arc could be connected to that of Struve and produce one arc of 105° length or over 11 500 km. He was of the opinion that Struve's son Otto had already extended the Arc of his father and Tenner to Crete but to date only details of the reconnaissance can be found, nothing to say that the work was actually carried out.

The preservation of these selected points will assist future generations to monitor the evolution of the geoid on which we live.

J R SMITH

Contact address for further details of the arc measurement and the project as a whole:

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IAG individual membership

IAG has recently introduced the individual membership as one of the new elements of the new IAG structure. The rights and privileges of individual members are listed in the IAG By-Laws. The Membership Application Form in PDF can be downloaded from the IAG website: <http://www.iag-aig.org>.

FIG e-Newsletter

The e-Newsletter of FIG (International Federation of Surveyors) provides the latest information about the FIG and its activities. The information referred in the e-Newsletter is in full length available on the FIG web site <http://www.fig.net/figtree/>. The FIG e-Newsletter is circulated by e-mail monthly since June 2003.

Meeting Announcements

IAG Sponsored Meetings

10 Years IGS Workshop and Symposium

March 1-5, 2004, Berne, Switzerland

To celebrate its 10-year anniversary, the International GPS Service (IGS) is organizing a four-day workshop and one-day symposium in the first week of March, 2004.

visit <http://www.igs2004.unibe.ch> for more information.

Second International GOCE User Workshop

"GOCE, The Geoid and Oceanography"

ESA-ESRIN, Frascati (Rome), Italy, 8-9-10 March 2004

visit <http://www.esa.int/goce04/> for more information.

EGU 1st General Assembly

Nice, France, 25-30 April, 2004

The 1st General Assembly of the European Geosciences Union (EGU) is held at the Nice - Acropolis Congress Centre in Nice, France, from 25 - 30 April 2004.

visit <http://www.copernicus.org/EGU/ga/egu04/index.html> for more information.

EUREF - 2004, The EUREF 2004 Symposium of the IAG Subcommittee for Europe

2-5 June 2004, Bratislava, Slovakia

visit <http://web.gku.sk/euref2004/> for more information.

15th International Symposium on Earth Tides

2-6 August 2004, Ottawa, Canada

The website has been updated with "Call for Session Proposals," "Registration," "Accommodation" and "Travel" information. visit <http://www.yorku.ca/ets/ets.html> for more information.

Gravity, Geoid and Space Missions – GGSM2004

August 30 – Sept. 3, 2004, Porto, Portugal

IAG International Symposium

visit <http://www.fc.up.pt/ggsm2004/> for more information.

12th General Assembly of the WEGENER project

21-23 September, 2004, Tangier, Morocco

For details, please visit: <http://www.fstt.ac.ma/wegener2004/>.

IAG Related Meetings

INTERGEO EAST 2004

4 - 5 March 2004, Belgrade, Serbia/Montenegro; Conference start: 3 March 2004

Trade Fair and Conference for land management, geoinformation, building industry and the environment

Visit <http://www.intergeo-east.com> for more information.

Ingenieurvermessung 2004 Zürich - 14th International Conference on Engineering Surveying

15-19 March 2004, Zürich, Switzerland

The detailed programme, further information and registration form are available under

<http://www.iv2004.ethz.ch>.

CCCT '04 Conference

August 14-17 2004, Austin, Texas, USA

2nd. International Conference on Computing, Communication and Control Technologies: CCCT '04

. For details, please visit: <http://www.iiisci.org/ccct2004/WebSite/Default.asp> .

Laser Scanner Conference

3 - 6 October 2004, Freiburg im Breisgau, Germany

International Conference "Laser-Scanners for Forest and Landscape Assessment - Instruments, Processing

Methods and Applications". For details, visit: <http://www.natscan.de/conference/>.

19th CODATA International Conference

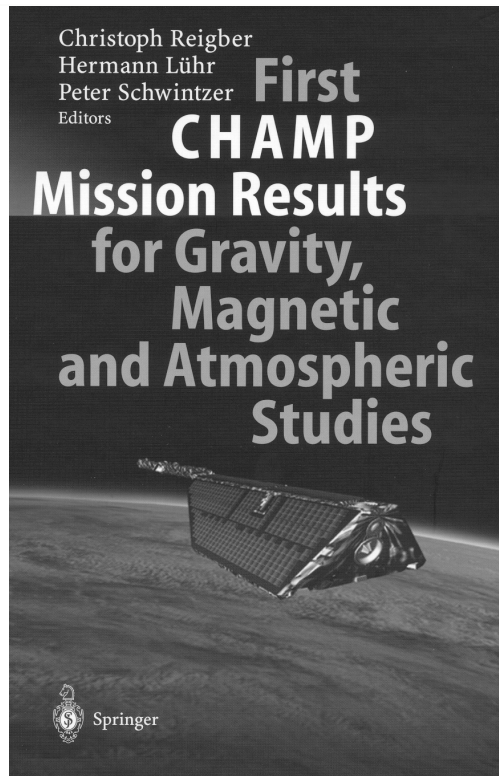
7-10 November 2004, Berlin, Germany

CODATA - Committee on Data for Science and Technology of the International Council of Science – ICSU

Title: "The Information Society: New Horizons for Science". Visit <http://www.CODATA.org/04conf> for more information.

Book Review

First CHAMP Mission Results for Gravity, Magnetic and Atmospheric Studies



title: First CHAMP Mission Results for Gravity, Magnetic and Atmospheric Studies
editors: Christoph Reigber, Hermann Lühr and Peter Schwintzer
publisher: Springer Verlag - Berlin / Heidelberg / New York
ISBN: 3-540-00206-5
year: 2003
price: US\$ 179
pages: 560
size: 16 x 24 cm
details: hard cover

In the summer of 2000, the CHAMP satellite was launched as the first implementation of three missions, CHAMP, GRACE and GOCE, whose objectives are aimed at measuring the Earth's Gravity Field. Among the three missions, CHAMP is unique in that it is the only mission to carry instruments to measure the Earth's Magnetic Field. The measurements promised by these three missions lead to the designation of 'The decade of the geopotential' for the first decade in this century. This manuscript is a compilation of selected presentations from the First CHAMP Science Meeting, which was held in Potsdam, one and a half years after the satellite launch and underscores the exciting promise of the measurements. Specially, the manuscript contains a summary of the mission status and a description of the science results at the end of the eighteen months of the mission. The editors have compiled the manuscripts with the objectives of summarizing the mission status, including the important questions of the instrument performance, and the scientific progress in three distinct areas. In the first two major sections, the manuscript contains an exciting look at the research directed at improving the model's for the Earth's Gravity and Magnetic field. In the third major section, it is shown that the instruments on CHAMP provide highly important information on the emerging field of satellite aeronomy. The contributions of the atmospheric profiles by occultation measurements in combination with the satellite density measurements provided by the on-board accelerometer are important contributions to the field of atmospheric science and operational meteorology. With regard to improvements in the Earth's Gravity Field Model, CHAMP provides the first set of high accuracy GPS measurements in combination with highly accurate accelerometer measurements of the surface forces due to atmospheric drag and solar radiation. This measurement compliment, along with the comparatively low altitude of CHAMP, represents a new and powerful data set for Gravity Model improvement.

The editors bring unique backgrounds for this effort. Professor-Dr-Ing Christoph Reigber has a long and distinguished record in the area of satellite geodesy and is one of the leading contributors to the improvement of the Earth's Gravity Field model with satellite measurements. He received his Ph.D. degree from the Technical University of Munich in 1969 and joined TUM as a Professor in 1982. Since 1991, he has been Director of GeoForschungZentrum (GFZ) Potsdam Division 1 Kinematics and Dynamics of the Earth. In addition, his role as Project Manager for the CHAMP Mission gives him a unique perspective on the potential as well as the overall performance of the entire suite of measurements. Professor Lühr is in charge of the magnetic field investigation and is responsible for the daily operations of CHAMP. Dr. Luhr received his Doctor's Degree in 1980 from the Technical University in Braunschweig. He is a Senior Scientist at GFZ and a faculty member at TUB and his current research focus is in developing improved Magnetic Field models. Dr.-Ing Peter Schwintzer is head of GFZ Division 1 Gravity Field and figure of the Earth Section and a lecturer at University of Potsdam. He received his Doctors degree from the University FAF in Munich and is intimately involved in Gravity Model development and precise orbit determination methodology.

The book contains 561 pages and is logically organized into three main sections: Orbit and Earth Gravity Field (with 29 articles), Earth Magnetic Field (with 23 articles) and Neutral Atmosphere and Ionosphere (with 23 articles). Each of the sections begins with discussions of the instruments on CHAMP that provides measurements relevant to that section. In addition to the instrument description, discussions related to the instrument performance and to the very important questions of instrument calibration and validation are included. These discussions are followed by discussions of data system issues, and the results from the analysis of the data close out the sections.

The section devoted to Orbit and Gravity Field contains discussions of the GPS receiver, the STAR accelerometer and the SLR corner-cube array. The GPS/accelerometer measurement set provides the primary information for the Gravity Model improvement. As noted before, this is the first set of such measurements and provides a unique set of measurements for understanding how accelerometer measurements can be used to replace satellite models for surface forces. This section could be viewed as required reading for anyone who plans to use the CHAMP data for either gravity model improvement or for the later described atmospheric density model studies. The topics of accelerometer performance and calibration, along with the clock and GPS performance and phase center calibration are important concerns in the data analysis and the treatments discussed here provide important direction for any future analysis. Finally, the gravity model results underscore the importance of the CHAMP data set and the several treatments on the use of the Energy Integral for Gravity Model Improvement represent a new and interesting line of research. To use this technique, accurate orbits from global and accurate tracking data are required. As an additional confirmation of the importance of the CHAMP data, it is of significance to note that satellite data sets and orbit accuracies achieved prior to CHAMP were of marginal use in studies using the energy integral.

The section devoted to the Earth Magnetic Field starts with a discussion of the ion drift meter instrument and its calibration along with a discussion of the procedures for deriving the magnetic field measurements. These are followed by discussions of the procedures for developing the Magnetic Field models. The later sections address the difficult and interesting questions of downward continuing the measurements at satellite altitude to obtain indications of crustal magnetic field. Of particular interest is a treatment that combines observations from CHAMP, Orestd and Magsat to look at magnetic anomalies in the Antarctic lithosphere. Finally, the section is completed with a very interesting series of discussions related to observing and explaining ionosphere current and associated plasma variations deduced from the CHAMP measurements.

The section on Neutral Atmospheric and Ionosphere Measurements focuses on the use of Radio Occultation Measurements obtained from a special antenna placed on the trailing edge of the CHAMP satellite to measure the signals from GPS satellites as they are influenced by the Earth's atmosphere as they pass behind the Earth. The section has a very good set of treatments on the techniques for recovering the ionosphere and atmosphere properties. The various presentations summarize the state of parameter recovery from the CHAMP data and outline some of the challenges involved in bringing the occultation product into an operational state for use by international meteorology centers. This section can be recommended as initial reading for individuals interested in entering this field.

The specialized and technical nature of the material suggest that the book is for individuals that have some background in satellite measurements and the use of these measurements for scientific purposes. As such, it can be recommended for advanced graduate students or for professional in the relevant areas of specialty. The organization into the three separate sections makes the material easily accessible to specialist from the three separate areas. However, there are articles in each of the three sections that are of general enough interest that, when reading the book, one should not confine attention to just one section. Overall, I found the material well prepared and a very interesting presentation of the remarkable accomplishments of the CHAMP mission.

Anyone involved in current research in either of the main themes covered in this treatment should have this book on the bookshelf.

PROFESSOR-DR-ING BYRON TAPLEY
CLARE COCKRELL WILLIAMS CHAIR
DIRECTOR, UNIVERSITY OF TEXAS CENTER FOR SPACE RESEARCH

Fast Bibliography

The fast bibliography consists of a listing of papers relevant to Geodesy, that has been collected by the IAG Bibliographic Service (IBS) since previous issue of the fast bibliography (Journal of Geodesy 77/5-6, August 2003). The IBS is based on the literary data bank GEOPHOKA, which is maintained by BKG (Budensamt für Kartographie und Geodäsie) at the Branch Office Leipzig, Leipzig Zentrale technisch – wissenschaftliche Angelegenheiten, Bibliothek, Karl-Rothe Strasse 10-14, 0415 Leipzig, Germany. The IBS can be reached at the following Internet address: <http://www.leipzig.ifag.de>. The bibliographic services are furthermore reachable through the homepage of IAG: <http://www.iag-aig.org>.

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