



International Association of Geodesy

Newsletter

October 2014

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IAG Communication and Outreach Branch
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Information Service of the International Association of Geodesy

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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

General Announcements

Call for Nominations for IAG Officers 2015-2019

Nominating Committee

M.G. Sideris (Chair), sideris@ucalgary.ca

B. Heck, bernhard.heck@kit.edu

S.R.C. de Freitas, sfreitas@ufpr.br

Y. Fukuda, fukuda@kugi.kyoto-u.ac.jp

August 4, 2014

Delegates of IAG Adhering Bodies

IAG Officers

IAG Fellows

IAG Members

Dear colleagues:

As you are aware of, the elections of IAG Officers for the period 2015-2019 shall take place by mail vote before the 2015 IAG General Assembly in Prague. The procedure for nominations and elections of Officers are given in section 39 of the IAG Bylaws (attached). According to the IAG Statutes, section 12, the voting members of the IAG Executive committee that should be elected are the following: President, Vice-President, Secretary General, Presidents of Commissions (4), Service representatives (3), members at large (2), and the President of the Communication and Outreach Branch. Their eligibility and terms of office are outlined in section 40 of the IAG Bylaws (attached).

The Nominating Committee is inviting you to submit nominations as follows:

- Submit nominations for all Officer positions listed above, except for the Service representatives who will be submitted by the Services.
- All nominations should be submitted to me, electronically or by regular mail, to the address given at the end of this letter.
- The deadline to submit nominations is **November 3, 2014**.

Based on the nominations received, the Nomination Committee will prepare a list of candidates for each position to be filled (normally two candidates per position) and will send it, by the end of 2014, to the delegates of the adhering bodies of the member countries, the officers of the Association, and those IAG fellows and individual members who took part in the nomination process. New nominations could be added to the list of candidates for six more weeks after this mailing, provided they are supported by at least two members of the Council. By mid February 2015 the final list of candidates will be sent out to the Council members for election. The result of the elections will be announced by the end of March 2015.

For any questions or concerns, please feel free to contact either me, or any of the other members of the Nominating Committee listed at the top of this letter.

I am looking forward to receiving your nominations and I thank you in advance for your prompt attention to this matter.

Yours truly,

Prof. Michael G. Sideris
Chair of the IAG Nominating Committee

Department of Geomatics Engineering

University of Calgary
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
CANADA

Fax: +1-403-284-1980
Email: sideris@ucalgary.ca

Call for Nominations for 3 Service Representatives to the 2015-2019 IAG EC

Nominating Committee

M.G. Sideris (Chair), sideris@ucalgary.ca
B. Heck, bernhard.heck@kit.edu
S.R.C. de Freitas, sfreitas@ufpr.br
Y. Fukuda, fukuda@kugi.kyoto-u.ac.jp

August 4, 2014

Chairs/Presidents of IAG Services
Directors of IAG Service Bureaus

Dear colleagues:

As you are aware of, the elections of IAG Officers for the period 2015-2019 shall take place by mail vote before the 2015 IAG General Assembly in Prague. The procedure for nominations and elections of Officers are given in section 39 of the IAG Bylaws (attached). According to the IAG Statutes, section 12, the voting members of the IAG Executive committee that should be elected are the following: President, Vice-President, Secretary General, Presidents of Commissions (4), Service representatives (3), members at large (2), and the President of the Communication and Outreach Branch. Their eligibility and terms of office are outlined in section 40 of the IAG Bylaws (attached).

The Nominating Committee is inviting you to consult with your Service and submit nominations as follows:

- Submit nominations only for the 3 Service representatives. All nominees should have a good record in the IAG Services. However, it is not a requirement that they be active within the Service you represent.
- All nominations should be submitted to me, electronically or by regular mail, to the address given at the end of this letter.
- The deadline to submit nominations is **November 3, 2014**.

Based on the nominations received, the Nomination Committee will try to get a good balance of all Services in the IAG Executive Committee (EC), will prepare a list of candidates for each position to be filled (normally two candidates per position) and will send it, by the end of 2014, to the delegates of the adhering bodies of the member countries, the officers of the Association, and those IAG fellows and individual members who took part in the nomination process. New nominations could be added to the list of candidates for six more weeks after this mailing, provided they are supported by at least two members of the Council. By mid February 2015 the final list of candidates will be sent out to the Council members for election. The result of the elections will be announced by the end of March 2015.

For any questions or concerns, please feel free to contact either me, or any of the other members of the Nominating Committee listed at the top of this letter.

I am looking forward to receiving your nominations and I thank you in advance for your prompt attention to this matter.

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Prof. Michael G. Sideris
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CANADA

Fax: +1-403-284-1980
Email: sideris@ucalgary.ca

26th IUGG General Assembly, June 22 – July 2, 2015



“Earth and Environmental Sciences for Future Generations” is the theme of the forthcoming General Assembly of the International Union of Geodesy and Geophysics (IUGG), to be held in Prague, Czech Republic, 22 June to 2 July 2015.

The IUGG General Assembly is held every four years, and brings together the eight associations of the IUGG to one venue, who organise a range of inter-disciplinary, cross-disciplinary and association-specific symposia. The IUGG associations are the International Association of Cryospheric Sciences (IACS), International Association of Geodesy (IAG), International Association of Geomagnetism and Aeronomy (IAGA), International Association of Hydrological Sciences (IAHS), International Association of Meteorology and Atmospheric Sciences (IAMAS), International Association for the Physical Sciences of the Ocean (IAPSO), International Association of Seismology and Physics of the Earth's Interior (IASPEI), and the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).

The joint symposia supported by the IAG are:

- Joint Inversion and Mutually Constrained Inversion of Geophysical Observations
- Results from SWARM, Ground Based Data and Earlier Satellite Missions
- Data on the Edge: Preservation and Utilization of Historical Data in the Geosciences
- Dynamics of the Cryosphere from Geometric and Gravimetric Observations
- Modelling the Atmosphere and Ionosphere by Space Measurements
- Variations of the Hydrosphere from Satellite Gravity Missions
- Extreme Hydrological Events
- Earth Systems Dynamics, Predictability and Probabilistic Forecasting
- Data Assimilation in Geophysical Sciences
- Sea Level Change and Variability: Past, Present and Future
- Satellite Oceanography and Climatology
- Geophysical Imaging of Natural Resources
- Deformation of the Lithosphere: Integrating Seismology and Geodesy through Modelling

One can see from the list above that modern geodesy is very much an Earth Observation Science, contributing to our understanding of the dynamic Earth. However geodesy is also the foundation for national mapping, land and environmental management, and supports the geospatial industries. In addition to the above multi-disciplinary symposium topics the IAG will also organise a series of symposia that reflect current geodetic technology and applications topics:

1. Reference Frames
2. Static Gravity Field Models and Observations
3. Variations of the Gravity Field
4. Earth Rotation and Geodynamics
5. GNSS⁺⁺: Emerging Technologies and Applications
6. Unified Height System

7. Geohazards Monitoring
8. Sea-Level Observation and Modelling

Prague, the capital city of the Czech Republic, lies in the heart of Europe and ranks amongst the most impressive historical cities in the world. The city has always played an important part in the history of the nation, and Europe. Since medieval times Prague has been distinguished as one of the most beautiful cities in the world, and is not only a centre of cultural movements dating back for centuries, it also exhibits a unique collection of historical monuments, mainly seen in the Prague Castle. Since 1992, the historical core of the city has been listed in the UNESCO World Cultural and Natural Heritage Register as a town with a unique and lively blend of Roman, Gothic, Renaissance, Baroque, Art Nouveau and Cubist architecture.

The 26th IUGG General Assembly 2015 will be held in the Prague Congress Centre, a purpose built venue with easy accessibility to many hotels in the near vicinity. With the underground station located within just 2 minute walking distance from the venue, the very heart of the city can be reached within minutes. The Call for Abstracts has been released, and the deadline for abstract submissions is 31 January 2015. For full details on abstracts, symposia, registration, and other conference information, please consult the IUGG2015 website. Look forward to seeing you in Prague!

Websites:

<http://www.iugg2015prague.com>

<http://www.iugg.org>

CHRIS RIZOS

Publications of the IAG Symposia series

IAG Symp. 140

Following the First International Workshop on the Quality of Geodetic Observation and Monitoring Systems (QuGOMS'11), held in Garching/Munich, Germany from April 13-15, 2011, 24 articles were accepted for publication. Main Editors are Hansjörg Kutterer, Florian Seitz, Hamza Alkhatib, and Michael Schmidt. Volume is currently under production and galley proofs were recently sent to authors. It should be published in January 2015

(<http://www.springer.com/earth+sciences+and+geography/geophysics/book/978-3-319-10827-8>).

IAG Symp. 141

Following the International Symposium on Gravity, Geoid and Height Systems (GGHS 2012) held in Venice, Italy from October 9-12, 2012, 42 manuscripts were accepted. Main editor is Urs Marti. Associate editors are Riccardo Barzaghi, Oliver Baur, Carla Braitenberg, Jianliang Huang, Shuanggen Jin, Isabelle Panet, Laura Sánchez, Herbert Wilmes. Volume is currently under production and galley proofs will be sent out to authors before the end of October. It should be published in January 2015.

(<http://www.springer.com/earth+sciences+and+geography/geophysics/book/978-3-319-10836-0>).

IAG Symp. 142

Following the VIIIth Hotine-Marussi, held in Rome, Italy, June 17-21, 2013, 41 manuscripts were accepted. Main Editor is Nico Sneeuw. Associate editors are A. Dermanis, Mattia Crespi, Robert Čunderlík, Richard Gross, Thomas Hobiger, Wieslaw Kosek, Pavel Novák, Eric Pottier, Fernando Sansò, Michael Schmidt, Matthias Weigelt. Volume is currently under production and should be published in early 2015

(<http://rd.springer.com/bookseries/1345>).

IAG Symp. 143



Following the IAG Scientific Assembly held in Potsdam, Germany from September 1-6, 2013, 124 manuscripts were submitted through the Springer submission Web site: <http://www.editorialmanager.com/iags>, which is now closed for submission. Review process is in progress but is expected to be finished very soon as only a couple of papers are still under review. Main editors are Chris Rizos, Pascal Willis. Associate editors are Hussein Abdelmotaal, Zuheir Altamimi, Xiaoli Deng, Annette Eicker, Jeff Freymueller, Dorota Grejner-Brzezinska, Manabu Hashimoto, Jianliang Huang, Urs Hugentobler, Allison Kealy, Hansjoerg Kutterer, Urs Marti, Roland Pail, Richard Gross, Laura Sanchez, Joao Agria Torres, Tonie van Dam, Pawel Wielgosz. Volume is expected to be published in early 2015 (<http://rd.springer.com/bookseries/1345>).

IAG Symp. 144 (number to be confirmed)

Following the 3rd International Gravity Field Service (IGFS) General Assembly (IGFS2014), held in Shanghai, China, from 30 June to 6 July 2014 (<http://202.127.29.4/meetings/igfs2014/proceeding.html>), a new proceeding is in preparation. Articles should be submitted to the following Springer Web page: <http://www.editorialmanager.com/iags/default.asp>. Deadline for submission was extended to October 31 2014. The first submissions have already been received and are under review. Main editor is Shuanggen Jin. Associate editors are Riccardo Barzaghi, Rene Forsberg, Urs Marti, Roland Pail.

IAG Symp. 145 (number to be confirmed)

Following the International Symposium on Geodesy for Earthquake and Natural Hazards (GENAH2014), held in Matsushima, Miyagi, Japan from July 22 to 26 2014 (<http://genah2014.jpn.org>), a new proceeding is in preparation. Articles should be submitted to the following Springer Web page: <http://www.editorialmanager.com/iags/default.asp>. Deadline for submission was extended to October 31 2014. The first submissions have already been received and are under review. Main editor is Manabu Hashimoto. Associate editors are Jeff Freymueller, Richard Gross, Shuanggen Jin, Cecile Lasserre, Simon McClusky, Yusaku Ohta, Tim Wright.

IAG Symp. 146 (number to be confirmed)

The next volume of the IAG Symposia Series will be related to the REFAG 2014 symposium (Reference Frames for Applications in Geosciences) that will be organized from 14 to 17 October 2014 in Luxemburg by the IAG Commission 1. Main Editor will be Tonie van Dam. Submissions are expected by November 30, 2014 using the Springer Web site: <http://www.editorialmanager.com/iags/default.asp>. Associate editors would be Zuheir Altamimi, Johannes Boehm, Tom Herring, Mikael Lilje, Richard Wonnacott.

CHRIS RIZOS (Editor)
PASCAL WILLIS (assistant Editor-in-Chief)

Special Issue BIM 148

The Special Issue BIM 148 relative to the 17th International Symposium on Earth Tides held in Warsaw (April 2013) is now available free of charge on the www.bim-icet.org website (ISSN 0542-6766).

The list of the scientific papers included in this issue (with ETS 2013 materials) is:

- VIRTANEN H., BILKER-KOIVULA M., MÄKINEN J., NÄRÄNEN J., RAJA-HALLI A., RUOTSALAINEN H. Comparison between measurements with the superconducting gravimeter T020 and the absolute gravimeter FG5-221 at Metsähovi, Finland in 2003-2012.
- CADICHEANU N., VAN RUYMBEKE M., PING ZHU, On the variability of the coupling between some Earth tides periodicities and earthquake triggering from three important seismic nest regions on Earth.
- PING ZHU, VAN RUYMBEKE M., QUINIF Y., CAMELBEECK TH., MEUS PH, Hydrological and tectonic strain forces measured from a karstic cave using extensometers.
- VAN RUYMBEKE M., WIELANT F., NOËL J.-P., DUMONT PH., Calibration of pendulum by sinusoidal torque induced with the needles of a watch turning in the gravity field of the Earth.
- VOLKOV V.A., DUBROV M.N, Geodynamical observations using spatially distributed gravimeters, tiltmeters, and laser strainmeters.
- ZHANG MIAOMIAO, XU JIANQIAO, SUN HEPING, SHEN WENBIN, CHEN XIAODONG, Comparison of noise levels of the new iGrav-007 superconducting gravimeter and the SG-065 superconducting gravimeter in Wuhan (China).

All the BIM issues (1-148) can be downloaded from the bim-icet.org website.

JEAN-PIERRE BARRIOT
ICET Director
Geodesy Observatory of Tahiti

Meeting Announcements

2nd Symposium of the Committee on Space Research (COSPAR): Water and Life in the Universe

November 9 – 13, 2015, Foz do Iguacu, Brazil

Contact:

COSPAR Secretariat, 2 place Maurice Quentin, 75039 Paris Cedex 01, France

Tel: +33 1 44 76 75 10

Fax: +33 1 44 76 74 37

cospar@cosparhq.cnes.fr

<http://cosparbrazil2015.org/>

Scientific Program Chair: Dr. Othon Winter, UNESP - São Paulo State University

Abstract Deadline: **31 May 2015**

Topics:

- Space astronomy missions to detect ingredients for life and exoplanets in the universe: status of current and future approved missions and new proposals
- Water and life in the universe and on Earth: impact on human consciousness and societies
- Satellite and probe missions for water remote sensing on Earth, planets, and other celestial bodies
- Water and Life in the Solar System
- Water from chemical, biological, and physical perspectives
- Role of water from the ground to the upper atmosphere
- Astrobiology: habitability, synthesis of organics in ice, and prebiotic chemistry in liquid water
- Water, organics and life support for human exploration in low Earth orbit, the Moon and beyond
- Interdisciplinary lectures, keynote talks, public lectures

Selected papers published in *Advances in Space Research* and *Life Sciences in Space Research*, fully refereed journals with no deadlines open to all submissions in relevant fields.

AARON JANOFKY
Associate Director
COSPAR

41st Scientific Assembly of the Committee on Space Research (COSPAR) and Associated Events

July 30 – August 7, 2016, Istanbul, Turkey

Contact:

COSPAR Secretariat, 2 place Maurice Quentin, 75039 Paris Cedex 01, France

Tel: +33 1 44 76 75 10

Fax: +33 1 44 76 74 37

cospar@cosparhq.cnes.fr

<http://www.cospar-assembly.org>

Scientific Program Chair: Prof. Ersin Gogus, Sabanci University
Abstract Deadline: Mid-February 2016

Topics:

Approximately 125 meetings covering the fields of COSPAR Scientific Commissions (SC) and Panels:

- SC A: The Earth's Surface, Meteorology and Climate
- SC B: The Earth-Moon System, Planets, and Small Bodies of the Solar System
- SC C: The Upper Atmospheres of the Earth and Planets Including Reference Atmospheres
- SC D: Space Plasmas in the Solar System, Including Planetary Magnetospheres
- SC E: Research in Astrophysics from Space
- SC F: Life Sciences as Related to Space
- SC G: Materials Sciences in Space
- SC H: Fundamental Physics in Space
- Panel on Satellite Dynamics (PSD)
- Panel on Scientific Ballooning (PSB)
- Panel on Potentially Environmentally Detrimental Activities in Space (PEDAS)
- Panel on Radiation Belt Environment Modelling (PRBEM)
- Panel on Space Weather (PSW)
- Panel on Planetary Protection (PPP)
- Panel on Capacity Building (PCB)
- Panel on Education (PE)
- Panel on Exploration (PEX)
- Panel on Exoplanetary Exploration (PEPE)
- Special events: interdisciplinary lectures, round table, etc.

Selected papers published in *Advances in Space Research* and *Life Sciences in Space Research*, fully refereed journals with no deadlines open to all submissions in relevant fields.

AARON JANOFKY
Associate Director
COSPAR

Meetings Calendar

Digital Earth Summit 2014

November 9-11, 2014, Nagoya, Japan

URL: <http://gis.chubu.ac.jp/summit2014/>

Third International VLBI Technology Workshop

November 10-13, 2014, Groningen/Dwingeloo, Netherlands

URL: <http://www.jive.nl/ivtw2014/>

International Technical Symposium on Navigation and Timing

November 17-18, 2014, Toulouse, France

URL: <http://cct.cnes.fr/content/international-technical-symposium-navigation-and-timing>

ISPRS Technical Commission I Symposium Sustaining Land Imaging: UAVs to Satellites

November 17-20, 2014, Denver, Colorado, USA

URL: <http://www.commission1.isprs.org/>

PECORA 19

November 17-20, 2014, Denver, Colorado, USA

URL: <http://pecora.asprs.org/>

ICSU GRC Conference “Improving Geophysical Risk Assessment, Forecasting and Management”

November 18-21, 2014, Madrid, Spain

URL: <http://www.icsu.org/>

Symposium SIRGAS 2014

November 24-26, 2014, La Paz, Bolivia

URL: <http://www.sirgas.org>

5th GOCE User Workshop

November 25-28, 2014, Paris, France

URL: <http://www.goce2014.org/>

11th International Conference on Location-based Services

November 26-28, 2014, Vienna, Austria

URL: <http://www.lbs2014.org/>

AGU 2014 Fall Meeting

December 15-19, 2014, San Francisco, CA, USA

URL: <http://sites.agu.org/meetings/>

18. Internationale Geodaetische Woche Obergurgl

February 8 – 14, 2015, Obergurgl, Austria

URL: <http://www.mplusm.at/ifg/>

GEOProcessing 2015

February 22 – 27, 2015, Lisbon, Portugal

URL: <http://www.iaria.org/conferences2015/GEOProcessing15.html>

Mapping Water Bodies from Space (MWBS 2015)

March 18 – 19, 2015, Frascati, Italy

URL: <http://due.esrin.esa.int/mwbs2015/>

Munich Satellite Navigation Summit 2015

March 24 – 26, 2015, Munich, Germany

URL: <http://www.munich-satellite-navigation-summit.org>

European Geosciences Union General Assembly 2015

April 12 – 17, 2015, Vienna, Austria

URL: <http://www.egu.eu>

SPACOMM 2015

April 19 – 23, 2015, Barcelona, Spain

URL: <http://www.iaria.org/conferences2015/SPACOMM15.html>

36th International Symposium of Remote Sensing of Environment (ISRSE)

May 11 – 15, 2015, Berlin, Germany

URL: <http://www.isrse36.org/>

8th Workshop on GNSS Reflectometry (GNSS+R 2015)

May 11 – 13, 2015, Potsdam, Germany

URL: <http://www.gnsr2015.org/>

22nd Meeting of the European VLBI Group for Geodesy and Astrometry (EVGA)

May 17 – 21, 2015, Ponta Delgada, Azores, Portugal

URL: <http://evga2015.raege.net/>

TransNav 2015

June 17 – 19, 2015, Gdynia, Poland

URL: <http://transnav2015.am.gdynia.pl>

XXVI IUGG General Assembly

June 22 – July 2, 2015, Prague, Czech Republic

Information about registration and accommodation will be available from June 2014. Call for abstracts will be open during summer 2014. Deadline for abstract submission is January 31, 2015.

URL: www.iugg2015prague.com

XXIXth IAU General Assembly

August 3 – 14, 2015, Honolulu, Hawaii, USA

URL: http://www.iau.org/science/meetings/future/general_assemblies/1024/

ISDE 2015

October 6 – 10, 2015, Halifax, Nova Scotia, Canada

URL: <http://isde2015halifax.ca/>

2nd Symposium of COSPAR: Water and Life in the Universe

November 9 – 13, 2015, Foz do Iguacu, Brazil

URL: <http://cosparbrazil2015.org/>

18th Geodynamics and Earth Tide Symposium 2016

June 6 – 9, 2016, Trieste, Italy

URL: <http://www.lithoflex.org/g-et/>

41st COSPAR Scientific Assembly

July 30 – August 7, 2016, Istanbul, Turkey

URL: <http://www.cospar-assembly.org/>

Obituary

Carl Christian Tscherning (1942-2014)



Professor Carl Christian Tscherning, former General Secretary of the International Association of Geodesy and editor of Bulletin Geodesique, and a charismatic, outspoken, and grand master of geodesy, died unexpectedly on October 24, 2014, from complications following operations for intestinal problems. During Christian's nearly 45 years of work with and for geodesy, including many years working actively for the International Association of Geodesy, Christian marked himself as a top level scientist especially in physical geodesy ("Mr. Collocation"), developing novel and advanced methods, always with a strong view on applications and practical software implementations, and being an inspirator, teacher and mentor for a long list of new generation students in geodesy and geophysics over the years.

Christian was born in Copenhagen in 1942, and already during his study years did he show his talent for quick decisions, outspokenness and political sense, as chairman for various student bodies during the turbulent years of the late 1960's, and his parallel education as officer in the Danish military reserve forces. He got his M.Sc. in geodesy 1970, and then joined the Danish Geodetic Institute. In his younger years he took part in geodetic survey

expeditions to Greenland (and early got renowned for his on-site commandeering of a Danish Navy helicopter to relieve a construction of a new astronomic pillar, saving his team mates many mountain backpacking trips with cement). His career at the Geodetic Institute involved both theoretical and practical geodesy, and he advanced to a position as State Geodesist shortly before he was appointed professor of geodesy at Copenhagen University in 1988.

His professorship at the Niels Bohr Institute, Copenhagen University, saw a broadening of his activities into satellite and classical geodesy, and supervision of a long list of M.Sc. and ph.d.-students, making sure a Danish tradition in geodesy was maintained, and passed on to a new generation of scientists. Christian truly enjoyed the interaction with the students, and they enjoyed his continuous enthusiasm and support. It was characteristic that Christian treated all persons attentive and nice, irrespectively of whether it was students, professors, kitchen staff, or visitors from far away. After his formal retirement in 2013 he continued as professor emeritus and consultant, active with planning of new geoid- and space-related trips up to a few days before his death.

Christian was a very visible and influential person in the international geodetic cooperation, starting with a longer research stay at Ohio State University in the early 1970's, and followed up by several later shorter research stays, hosted by leading colleagues at institutions in the US and Europe. The development of the "Tscherning-Rapp" covariance model, the collocation software, including the early utilization of high-degree geopotential models, and lately his work in connection with GOCE, all show his involvement in state-of-the art physical geodesy. Scientific symposia with Christian present, either as speaker or a loud-spoken member of the audience, were never dull. Few people escaped Christian's pointed questions at scientific conferences, but such questions nearly always seemed intended to strengthen other people's research and make the field of geodesy more robust.

His sense for humour and situational awareness can be illustrated with an old anecdote from an 1972 IAG symposium in Graz, where a tour to Lake Balaton, swimming with famous geodesists (Dufour, Ashkenazi, Ivan Müller, Helmut Moritz and more), prompted his remark "Toute la Geodesie sans Pantalons" ("all of geodesy without pants"), inspired by Dufours talks on "Toute la Geodesie sans Ellipsoide". Christians usually good-humoured attitude, his leadership of many study groups and projects, and his help to many in large or small geodetic and non-geodetic matters, has given him a large network of global friends, many of whom have also spend shorter or longer periods in Copenhagen, or his summer house in Spain. Here he, and his wife Janni since more than 40 years, enjoyed long periods of relaxing, socializing or thinking science.

Christian's scientific production was more than 290 papers and technical reports, many of which can be downloaded from his homepage (<http://cct.gfy.ku.dk>). He has supervised more than 25 ph.d. students and inspired numerous international students, a.o. through the IAG International Geoid Schools.

Christian will be missed by his colleagues in Denmark and fellow scientists internationally. A chief in geodesy has passed away..

RENE FORSBERG
DTU-Space



"5 geodetic musketeers" at the first International Geoid School, Milano, 1995 (photo courtesy F. Sanso).