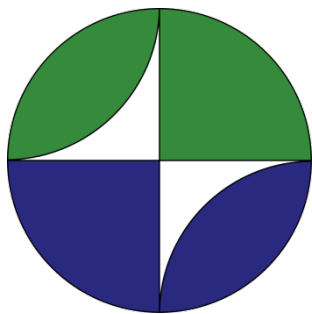


INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE

Yearbook 2019



INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
UNION GEODESIQUE ET GEOPHYSIQUE INTERNATIONALE

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INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS UNION GÉODÉSIQUE ET GÉOPHYSIQUE INTERNATIONALE

HISTORIQUE

L'Union Géodésique et Géophysique Internationale (UGGI) est un organisme international non gouvernemental à but non lucratif fondé à Bruxelles le 28 juillet 1919. L'UGGI se consacre à l'étude scientifique de la Terre et à l'utilisation au profit de la société des connaissances acquises grâce à cette étude. L'UGGI est l'une des trois Unions scientifiques ayant participé en 1931 à l'Assemblée constitutive du Conseil international des recherches, devenu ensuite le Conseil international des unions scientifiques (CIUS) en 1996, devenu enfin Conseil international pour la science (CIS) en 2018. Le CIS est un forum planétaire des scientifiques, qui leur permet d'échanger des idées et des informations, promeut la science en tant que bien public universel, et exprime l'expression universelle de la science. L'UGGI fournit son savoir-faire concernant les sciences de la Terre effectuées par les chercheurs dans ses Associations internationales et Commissions inter-associations.

Les neuf premiers pays membres de l'UGGI étaient l'Australie, la Belgique, le Canada, la France, l'Italie, le Japon, le Portugal, le Royaume-Uni et les États-Unis. En 2019, l'UGGI compte 72 organismes adhérents ayant une activité géodésique ou géophysique indépendante.

Au début, l'Union chapeautait six sections : Géodésie, Séismologie, Météorologie, Magnétisme et électricité terrestre, Océanographie physique et Volcanologie. Une septième section, «Hydrologie Scientifique», fut créée en 1922. Le terme «Section» fut remplacé par celui d'«Association» lors de la cinquième Assemblée générale tenue à Lisbonne, en 1933. Une huitième Association sur les Sciences Cryosphériques fut créée lors de l'Assemblée Générale de 2007 à Pérougia, Italie.

Les langues officielles de l'UGGI sont l'anglais et le français.

BACKGROUND

The International Union of Geodesy and Geophysics (IUGG) is an international, non-governmental, non-profit organization established in Brussels on 28 July 1919. IUGG is dedicated to the scientific study of the Earth and the application of knowledge gained by such studies to benefit society. IUGG was one of the first three Scientific Unions established during the Constitutive Assembly of the International Research Council, the predecessor of the International Council of Scientific Unions (ICSU) created in 1931, known as the International Council for Science since 1996, and as the International Science Council (ISC) since 2018. ISC provides a global forum for scientists to exchange ideas and information, advances science as a global public good, and presents a global voice of science. IUGG brings to ISC expertise on Earth studies from researchers in its International Associations and Inter-Association Commissions.

The first nine member countries of IUGG were Australia, Belgium, Canada, France, Italy, Japan, Portugal, the United Kingdom, and the United States. By 2019, IUGG has 72 Member Countries in which independent activity in geodesy and geophysics has been developed.

The original Union encompassed six Sections: Geodesy, Seismology, Meteorology, Magnetism and Terrestrial Electricity, Physical Oceanography, and Volcanology. A seventh section "Scientific Hydrology" was created in 1922. The term "Section" was replaced by "Association" at the 5th General Assembly held in Lisbon in 1933. The eighth Association of Cryospheric Sciences was added at the 2007 General Assembly held in Perugia, Italy.

The official languages of IUGG are English and French.

OBJECTIFS ET ACTIVITÉS DE L'UGGI

L'UGGI est une organisation purement scientifique, qui a été fondée afin de promouvoir et de coordonner les études sur les propriétés physiques, chimiques et mathématiques de la Terre et sur son environnement spatial. Ces études concernent la forme de la Terre; la nature de ses champs gravitationnel et magnétique; la dynamique de la Terre en tant qu'entité et de celle de ses composants; la structure interne, la composition et la tectonique de la Terre; la formation des magmas; la volcanologie et la genèse des roches; le cycle hydrologique, dont la neige et la glace; la physique et la chimie des océans; l'atmosphère, l'ionosphère, la magnétosphère et les relations Soleil-Terre; ainsi que les problèmes analogues propres à la Lune et aux autres planètes. Les activités de l'UGGI comprennent l'observation de la Terre par satellite et par d'autres techniques de mise en place d'instruments à haute altitude.

Programmes de recherche interdisciplinaire

L'UGGI a inauguré et activement soutenu les efforts de collaboration qui ont permis de mettre en œuvre des programmes de recherche interdisciplinaire internationaux de grande valeur, dont l'Année Géophysique Internationale (1957-1958), le Projet du Manteau Supérieur de la Terre (1964-1970), la Décennie Hydrologique Internationale (1965-1974), le Projet Géodynamique (1972-1979), le Programme Global de Recherche sur l'Atmosphère (1967-1980), le Programme Mondial de Recherche sur le Climat (1980-présent), le Programme International de la Lithosphère (1981-présent) et le Système Global d'Observation Géodésique (2003-présent). Ces programmes ont servi de modèle de coopération internationale et interdisciplinaire. L'UGGI a inauguré et soutenu des initiatives du CIUS, surtout ceux qui concernent les sciences de la Terre. L'une des contributions majeures de l'UGGI a été la création, il y a environ 60 ans, par l'intermédiaire du CIUS, du système de la Banque de Données Mondiale et de la Fédération des Services d'Analyse des Données Astronomiques et Géophysiques. Ceux-ci ont été transformés en Système de Données Mondial du CIUS qui mettra les données recueillies dans le cadre de ces grands programmes à la disposition des chercheurs du monde entier. L'UGGI a soutenu l'Année Internationale de la Terre (2007-2009) et l'Année Polaire Internationale (2007-2008) et a aussi initié et soutenu l'Année Géophysique Électronique (2007-2008) et l'Année Héliophysique Internationale (2007-2008).

Recherche internationale en coopération

L'UGGI collabore avec l'UNESCO à l'étude des catastrophes naturelles, des océans, et de l'hydrologie. Elle attache aussi une grande importance aux problèmes scientifiques des pays en voie de développement, en parrainant des activités liées aux besoins scientifiques du tiers monde. L'UGGI est un partenaire d'autres Unions Scientifiques du CIS, par le biais des Commissions inter-unions, et ses activités correspondent avec celles de huit autres Unions du CIS (GéoUnions): l'Union Astronomique Internationale (UAI), l'Association Cartographique Internationale (ACI), l'Union Géographique

OBJECTIVES AND ACTIVITIES OF IUGG

IUGG is a purely scientific organisation established to promote and co-ordinate studies of physical, chemical, and mathematical properties of the Earth and its environment in space. These studies include the shape of the Earth; the nature of its gravitational and magnetic fields; the dynamics of the Earth as a whole and of its component parts; the Earth's internal structure, composition, and tectonics; the generation of magmas; volcanism and rock formation; the hydrological cycle including snow and ice; the physics and chemistry of the oceans; the atmosphere, ionosphere, magnetosphere and solar-terrestrial relations; and analogous problems associated with the Moon and other planets. IUGG activities embrace studies of the Earth by artificial satellites and other techniques for deploying instruments at high altitude.

Interdisciplinary Research Programs

IUGG has initiated and vigorously supported collaborative efforts that have led to highly productive world-wide interdisciplinary research programs, such as the International Geophysical Year (1957-58), the Upper Mantle Project (1964-70), the International Hydrological Decade (1965-74), the Geodynamics Project (1972-79), the Global Atmospheric Research Program (1967-80), World Climate Research Programme (1980-present), International Lithosphere Program (1981-present), Global Geodetic Observing System (2003-present) and others. These programs have set a model for international, interdisciplinary co-operation. IUGG has initiated and supported ICSU initiatives, especially those in which Earth sciences have a role to play. One major contribution was the creation, about 60 years ago, through ICSU, of the World Data Centers and the Federation of Astronomical and Geophysical Data Analysis Services. These were transformed to the ICSU World Data System, from which the data gathered during major research programs and data products will be available to researchers everywhere. IUGG supported the International Year of the Planet Earth (2007-2009) and the International Polar Year (2007-2008) and has initiated and supported the Electronic Geophysical Year (2007-2008) and the International Heliophysical Year (2007-2008).

Worldwide Co-operative Research

IUGG co-operates with UNESCO in the study of natural catastrophes, oceans, and hydrology. It also gives particular emphasis to the scientific problems of Developing Countries by sponsoring activities relevant to the scientific needs of the Third World. IUGG is a partner with other ISC Scientific Unions in inter-Union Commissions, and coordinates its activities with eight other ISC Unions (GeoUnions): the International Astronomical Union (IAU), the International Cartographic Association (ICA), the International Geographical Union (IGU), the International Society of Photogrammetry and Remote Sensing (ISPRS), the International Union of Geological Sciences (IUGS), the International Union for Quaternary Research (INQUA), the

Internationale (UGI), la Société Internationale de Photogrammétrie et de Télédétection (SIPT), l'Union Internationale des Sciences Géologiques (UISG), l'Union Internationale pour l'Étude du Quaternaire (INQUA), l'Union Radio-Scientifique Internationale (URSI) et l'Union Internationale de la Science du Sol (UISS).

STRUCTURE

De par leur nature même, les études géodésiques et géophysiques requièrent une importante coopération internationale, de même qu'une coordination efficace. L'UGGI, heureusement, compte 72 entités adhérentes (Tableau 1); les entités adhérentes sont répartis dans le monde entier, comme le montre le Tableau 2. En outre, l'UGGI possède six membres affiliés (Tableau 3).

Comités nationaux

La grande majorité des entités adhérentes participent aux activités de l'UGGI à travers leur Comité National de l'UGGI, mis en place par l'Académie nationale ou une autre institution officielle du pays adhérent à l'Union (il existe d'autres méthodes d'adhésion). Chaque Comité national de l'UGGI est représenté aux Assemblées Générales de l'UGGI par un délégué nommé par l'entité adhérente.

Assemblées générales

Les Assemblées générales de l'UGGI ont lieu tous les quatre ans. La prochaine Assemblée générale de l'UGGI sera la XXVIIe et se tiendra à Montréal, Canada, en 2019. L'UGGI tient des Assemblées Générales depuis 1922. Depuis 1963, elles ont lieu tous les quatre ans. Le Tableau 4 indique les années et les localisations des Assemblées générales de l'UGGI.

Au cours de ces Assemblées générales, on adopte les politiques régissant l'UGGI et on définit et coordonne les programmes nécessitant une participation internationale. De plus, on élabore les plans d'exécution de ces programmes de recherche. Les résultats scientifiques des programmes en cours font l'objet de discussions lors d'un grand nombre de symposiums, de réunions de commissions, de groupes de travail ou de rencontres réunissant les scientifiques assistant aux Assemblées.

Le Conseil, le Bureau et les Comités de l'UGGI

L'UGGI est dirigée par le Conseil de l'UGGI, lequel est régi par les statuts et le règlement intérieur de l'Union. Le Conseil de l'UGGI est composé des délégués accrédités des entités adhérentes. Le Conseil de l'UGGI se réunit lors de l'Assemblée Générale de l'UGGI, où il est procédé à l'élection des membres du Bureau de l'UGGI et du Comité des finances de l'UGGI. Depuis 2016 UGGI a le Conseil permanent; les membres du Conseil (2016-2019) seront présentés à la page 16.

Le Bureau de l'UGGI traite des affaires administratives entre les rencontres du Conseil. Ses membres, élus par le Conseil, sont au nombre de sept – quatre responsables (Président, Vice-président, Secrétaire général et Trésorier) et trois membres associés. Le Bureau se réunit chaque année.

International Union of Radio Science (URSI), and the International Union of Soil Sciences (IUSS).

STRUCTURE

By their very nature, geodetic and geophysical studies require a high degree of international co-operation as well as effective central co-ordination. IUGG is fortunate in having 72 Member Adhering Bodies (Table 1); the Members are distributed throughout the world as shown in Table 2. In addition, IUGG has six Affiliate Members (Table 3).

National Committees

The great majority of Member Adhering Bodies participate through IUGG National Committees set up by the national academy or another body in their country that adheres to the Union (other methods of adherence do occur). Each IUGG National Committee is represented at the IUGG General Assemblies by a Delegate appointed by its Adhering Body.

General Assemblies

IUGG General Assemblies are held every four years. The next XXVII (27th) IUGG General Assembly will be held in Montreal, Canada, in 2019. IUGG General Assemblies have been held since 1922. Since 1963, they are held every four years. Table 4 lists the years and locations of IUGG General Assemblies.

During these General Assemblies, policies governing IUGG are adopted, research programs requiring international participation are formulated and coordinated. In addition, plans are drawn for the execution of research programs. The scientific results of programs in progress are discussed at the numerous Symposia, Commission and Working Group meetings, and other gatherings of scientists that are convened during these assemblies.

The IUGG Council, Bureau, and Committees

IUGG's affairs are directed by the Union Council governed by the Statutes and By-Laws of the Union. The IUGG Council is composed of one credentialed delegate from each Adhering Body. The IUGG Council meets during the IUGG General Assembly and elects the IUGG Bureau and the IUGG Finance Committee. Since 2016, IUGG has a standing Council; the Council Delegates (2016-2019) are listed on page 16.

The IUGG Bureau handles administrative affairs between Council meetings. It is elected by the Council and consists of seven members – four officers (President, Vice-President, Secretary General, and Treasurer) and three members at large. The Bureau meets annually.

Le Comité directeur de l'UGGI travaille en vue d'atteindre les objectifs scientifiques de l'Union et des Associations internationales grâce à une coordination et une définition efficace des politiques générales. Il regroupe les membres du Bureau de l'UGGI, le président sortant de l'Union et les présidents des Associations internationales.

The IUGG Executive Committee works to further the scientific objectives of the Union and International Associations by effective co-ordination and formulation of general policies. It consists of the IUGG Bureau, the retiring president of the Union, and the Presidents of the International Associations.

Le Comité des finances de l'UGGI traite des affaires budgétaires avec le Trésorier de l'UGGI. Il regroupe personnes élues par le Conseil de l'UGGI. Les membres du Comité des finances ne peuvent être membres ni du Bureau de l'UGGI, ni du Comité directeur de l'UGGI.

The IUGG Finance Committee interacts with the IUGG Treasurer regarding budgetary matters. It consists of persons elected by the IUGG Council. The members of the Finance Committee are not members of the IUGG Bureau or the IUGG Executive Committee.

Les Associations internationales

Les huit Associations internationales semi-autonomes de l'UGGI assument, chacune, les responsabilités relatives à une série de sujets ou de thèmes spécifiques, relevant des activités générales de l'Union. Chaque Association possède sa propre sous-structure, comme il sera expliqué ci-dessous. Les Associations internationales définissent des normes de recherche et conviennent de définitions et d'algorithmes, tels que le *Manual of Seismological Observatory Practice* ou le *Guide for Magnetic Repeat Station Surveys*. Pour les sujets importants les résolutions doivent être adoptées à l'unanimité. Ils transmettent dans le cadre de leur mission éducative les résultats de leurs recherches à la communauté scientifique internationale, aux agences gouvernementales, aux entreprises et au grand public. Les huit Associations internationales sont les suivantes:

The International Associations

The eight semi-autonomous International Associations within IUGG are each responsible for a specific range of topics or themes within the overall scope of the Union's activities. Each has a sub-structure as discussed below. The International Associations work to set standards for research and agree on definitions and algorithms, such as the *Manual of Seismological Observatory Practice* or the *Guide for Magnetic Repeat Station Surveys*. Participants pass resolutions on important issues where all agree. They make research visible to the international scientific community, to governmental agencies, to industry, and to the general public through their education activities. These eight International Associations are as follows:

Association Internationale des Sciences Cryosphériques (AISC)
International Association of Cryospheric Sciences (IACS)

Association Internationale de Géodésie (AIG)
International Association of Geodesy (IAG)

Association Internationale de Géomagnétisme et d'Aéronomie (AIGA)
International Association of Geomagnetism and Aeronomy (IAGA)

Association Internationale des Sciences Hydrologiques (AISH)
International Association of Hydrological Sciences (IAHS)

Association Internationale de Météorologie et des Sciences de l'Atmosphère (AIMSA)
International Association of Meteorology and Atmospheric Sciences (IAMAS)

Association Internationale pour les Sciences Physiques des Océans (AISPO)
International Association for the Physical Sciences of the Oceans (IAPSO)

Association Internationale de Séismologie et de Physique de l'Intérieur de la Terre (AISPIT)
International Association of Seismology and Physics of the Earth's Interior (IASPEI)

Association Internationale de Volcanologie et de Chimie de l'intérieur de la Terre (AIVCIT)
International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

Les Associations internationales jouent également un rôle particulier en faisant bénéficier tous les pays du monde des dernières avancées scientifiques, grâce à des rencontres, des ateliers et des assemblées. Les Associations internationales tiennent leurs propres Assemblées scientifiques tous les

The International Associations also play a special role in bringing state-of-the art science to all the countries of the world through meetings, workshops, and assemblies. The International Associations convene their own Scientific Assemblies approximately every four years, generally two

quatre ans environ, généralement deux ans avant la tenue de l'Assemblée générale de l'UGGI. En 2017, les Assemblées scientifiques des Associations étaient ainsi: de l'AISC en Nouvelle-Zélande, de l'AISH en Afrique du Sud, l'Assemblée conjointe de l'AIG et l'ASPIT en Japon, l'Assemblée conjointe de l'AIGA, l'AIMSA et l'ASPO en Afrique du Sud, et de l'AIVCIT en États-Unis. Lors des Assemblées scientifiques, les Associations internationales parrainent des symposiums sur des sujets particuliers, souvent en partenariat.

Les géodésiens et les géophysiciens de tous les pays du monde sont invités à participer aux nombreux symposiums et ateliers des Associations internationales et des Assemblées générales de l'UGGI. Lors de ces rencontres, les scientifiques ont l'occasion de discuter de leurs méthodologies, résultats et hypothèses respectifs, et de planifier des projets de recherche en collaboration.

Les symposiums ont vocation à s'adresser tout particulièrement aux jeunes scientifiques des pays en voie de développement. L'UGGI a prévu un budget particulier pour assurer leur participation aux symposiums organisés sous l'égide de l'Union et de ses Associations.

Comme l'UGGI, les Associations internationales sont gérées par des officiers qui sont élus pendant leurs Assemblées Générales. Dans son domaine respectif, chaque Association est responsable de la définition de son propre programme et de soutenir les activités de ses propres composantes.

Commissions de l'Union

En raison de la nature interdisciplinaire des domaines traités par les Associations internationales, plusieurs Commissions de l'Union ont été créées pour assister l'Union et la communauté géophysique internationale pour promouvoir l'étude de problèmes interdisciplinaires particuliers. Ces organisations sont habilitées par le Comité directeur de l'UGGI à mener des recherches conjointes entre les Associations. Les commissions de l'Union font l'objet d'un examen et d'un remaniement lors de chaque Assemblée générale de l'UGGI. Les six Commissions et Groupe de travail suivantes sont actuellement en activité:

- Commission de l'union sur les changements climatiques et les modifications de l'environnement (CCEC)
- Commission de l'union sur la géophysique mathématique (CMG)
- Commission de l'union sur les risques géophysiques et le développement durable (GRC)
- Commission de l'union sur l'étude des profondeurs terrestres (SEDI)
- Commission de l'union sur les données et l'information (UCDI)
- Commission de l'union sur la planétologie (UCPS)
- Groupe de travail sur l'histoire (WGH)

En outre, deux ou plusieurs Associations internationales peuvent créer et soutenir des groupes de travail conjoints chargés de sujets scientifiques spécifiques.

years following the IUGG General Assembly. In 2017, the following scientific assemblies were held: IACS in New Zealand, IAHS in South Africa, a joint assembly of IAG and IASPEI in Japan, a joint assembly of IAGA, IAMAS, and IAPSO in South Africa, and IAVCEI in the USA. At Scientific Assemblies the International Associations sponsor symposia on particular topics, often in partnership with one another.

Geodesists and geophysicists from all countries of the world are encouraged to attend the numerous Symposia and Workshops of the International Associations and the General Assemblies of IUGG. At these meetings scientists have the opportunity to discuss their respective methodologies, results, and hypotheses and to plan collaborative research projects.

The Symposia are intended to be particularly helpful to younger scientists from developing countries of the world. The IUGG has made special financial provision for them to participate in the Symposia organised under the aegis of the Union and its Associations.

Like IUGG, International Associations are managed by officers who are elected during their General Assembly. Within its own discipline each Association is responsible for determining its own program of investigations and for supporting the activities of its own component parts.

Union Commissions

Owing to the interactive nature of the subject fields managed by the International Associations, several Union Commissions and a Working Group have been established which serve the Union and the international geophysical community by promoting the study of particular interdisciplinary problems. These bodies are chartered by the IUGG Executive Committee to conduct inter-association science. Union Commissions are reviewed and renewed at each IUGG General Assembly. The following six Commissions and Working Group are presently active:

- Union Commission on Climatic and Environmental Change (CCEC)
- Union Commission on Mathematical Geophysics (CMG)
- Union Commission on Geophysical Risk and Sustainability (GRC)
- Union Commission on the Study of the Earth's Deep Interior (SEDI)
- Union Commission on Data and Information (UCDI)
- Union Commission on Planetary Sciences (UCPS)
- Working Group on History (WGH)

In addition, two or more International Associations may set up and support joint working groups to address specific scientific topics.

Commission Inter-Unions

Le Programme International du Lithosphère, guidé par le Comité Scientifique du Lithosphère (SCL), fut établi en 1980 comme la Commission Inter-Union sur le Lithosphère (ICL) par le Conseil International des Sciences (CIUS), selon la demande de l'Union Internationale des Sciences Géologiques (IUGS) et l'Union Géodésique et Géophysique Internationale (UGGI). Le nom fut changé au Comité Scientifique sur le Lithosphère en 1999. Selon la Décision 8.4 de l'Assemblée Générale de 2005 du CIUS, le CIUS a décidé de terminer son soutien du SCL/ILP et de recommander un décalage de responsabilité vers l'UGGI et l'IUGS. Depuis cette décision, l'UGGI et l'IUGS ont rétabli la mission du ILP et ont collaboré pour re-définir l'ILP comme une entité Inter-Union. Des nouveaux Termes de Référence ont été approuvés par les deux Unions.

FINANCES

L'UGGI collecte les cotisations annuelles pour financer les projets scientifiques inter-unions, les initiatives inter-associations et les activités administratives de l'UGGI, y compris ses publications. La moitié du revenu net de l'UGGI est remis aux Associations internationales qui peuvent décider de l'utilisation de ces fonds.

Le revenu de l'Union provient des contributions annuelles des entités adhérentes. Les entités adhérentes ont le choix entre le statut de membre régulier ou de membre associé (ne payant pas de cotisation). Les entités adhérentes peuvent envoyer un délégué aux rencontres quadriennales du Conseil de l'UGGI et voter sur les affaires administratives. Les scientifiques des entités adhérentes peuvent occuper un poste de responsabilité dans les Associations internationales et ils ont un droit de vote lors des séances de travail. Les membres associés ne paient pas de cotisations, n'ont pas le droit de voter, et leurs scientifiques ne peuvent pas occuper un siège de responsabilité dans le comité exécutif ou financier de l'UGGI. Les scientifiques des entités adhérentes associés sont toutefois les bienvenus aux activités scientifiques et sociales tenues lors de toutes les rencontres de l'UGGI et des Associations internationales. Les données scientifiques et les recherches effectuées par les entités adhérentes associées sont prises en considération par les autres scientifiques, et nombreuses sont les occasions de rencontres et de collaboration avec d'autres participants de l'UGGI. Si la situation économique d'un pays ne lui permet pas l'adhésion de plein droit à l'UGGI, le statut de membre associé peut être une étape vers l'adhésion de plein droit.

Les cotisations qu'une entité adhérente régulière paye sont calculées selon un barème (en fonction de la 'catégorie - Table 1') défini par le Comité des finances de l'UGGI. Les catégories reflètent la situation économique du pays et à sa participation aux Assemblées Générales de l'UGGI. Les détails figurent dans le titre III des statuts et le titre III du règlement intérieur de l'UGGI. Chaque catégorie correspond à un nombre d'unités permettant de calculer la cotisation. En 2019 la valeur d'une

Inter-Unions Commission

The International Lithosphere Program, guided by the Scientific Committee on the Lithosphere (SCL), was established in 1980 as the Inter-union Commission on the Lithosphere (ICL) by the International Council for Science (ICSU), at the request of the International Union of Geological Sciences (IUGS) and the International Union of Geodesy and Geophysics (IUGG). The name was formally changed to the Scientific Committee on the Lithosphere in 1999. According to Decision 8.4 from the 2005 ICSU General Assembly, ICSU decided "to withdraw ICSU sponsorship from SCL/ILP and to recommend that responsibility would then shift to IUGG and IUGS." Since that time, IUGG and IUGS have reaffirmed the ILP mission and have collaborated to re-define ILP as an inter-Union body. New Terms of Reference have been approved by both Unions.

FINANCES

IUGG collects annual contributions to carry out its support for Inter-Union science, Inter-Association initiatives, and IUGG administration, including IUGG publications. One half of IUGG's net income from the previous year is passed to the International Associations to use as they see fit.

The income of the Union comes from annual contributions of the Members. Member Adhering Bodies can choose to be regular paying Members or Associate (non-paying) Members. Members may send a delegate to quadrennial meetings of the IUGG Council and vote on matters of business. Scientists from regular Members may hold office in the International Associations and vote at their business meetings. Associate Members pay no contributions, have no voting rights, and their scientists may not hold offices in the IUGG Executive Committee and Finance Committee. However, scientists from Associate Member countries are welcome to attend all scientific and social activities at all IUGG and International Association meetings. The scientific data collected and research performed within Associate Member countries is valued by other scientists and the opportunities for networking and collaboration with other IUGG participants are abundant. Associate Membership can be a first step toward regular membership, if a country's economic condition does not currently permit the payment of annual dues.

A regular Member Adhering Body pays dues according to a scale ("the category number - See Table 1") established by the IUGG Finance Committee. Categories are related to the economic condition of the country and its participation in IUGG General Assemblies. Details are specified in Statute III and By-Law III of IUGG. Each category has an associated number of Units used to determine the dues to be paid. The value of a single Unit of membership in 2019 is USD 2,020. The Finance Committee uses an algorithm to determine the price of a Unit. The Finance Committee also reviews the

unité de cotisation est de USD 2020. Le Comité des finances utilise un algorithme pour déterminer le montant de l'unité. Le Comité des finances examine également la catégorie d'adhésion de chaque entité adhérente au moins une fois tous les quatre ans.

Tout défaut de paiement d'une cotisation par un pays entraîne son passage dans une catégorie particulière de membres sans droit de vote, dits «observateurs». Le défaut prolongé de paiement des cotisations peut entraîner l'expulsion d'un pays de l'UGGI.

category of membership for each Member Adhering Body at least every four years.

Failure to pay fees in a timely manner places a country into a special class of non-voting membership known as "observers". Continued failure to pay fees is grounds for expulsion from IUGG.

Table 1: Member Adhering Bodies of IUGG

MEMBERS	Dates of ADMISSION & TERMINATION	CATEGORY ⁽¹⁾	UNITS ⁽²⁾
ALBANIA	1997-2002, 2003	A	0
ALGERIA	1971-2006, 2018	1	1
ARGENTINA	1927	3	3
ARMENIA	2000	A	0
AUSTRALIA	1919	5	7
AUSTRIA	1948	3	3
AZERBAIJAN	2010	1	1
BELGIUM	1919	4	5
BOLIVIA	1960-2000, 2006	A	0
BOSNIA & HERZEGOVINA	2003	A	0
BRAZIL	1922	3	3
BULGARIA	1930	1	1
<i>BURUNDI</i>	<i>1987-1995</i>		
CANADA	1919	6	10
CHILE	1924	2	2
CHINA	1977	6	10
CHINA – Acad. of Sciences in Taipei	1995	4	5
COLOMBIA	1938-1971, 2000	1	1
CONGO D.R. (**)	2004	A	0
COSTA RICA	2010	1	1
CROATIA	1992	1	1
<i>CUBA</i>	<i>1960-1996</i>		
CZECH REPUBLIC	1993	2	2
DENMARK	1923	4	5
<i>DOMINICAN REP.</i>	<i>1957-1971</i>		
EGYPT	1924	2	2
ESTONIA	1991	1	1
<i>ETHIOPIA</i>	<i>1952-2000</i>		
FINLAND	1927	3	3
FRANCE	1919	7	15
GEORGIA	2009	A	0
GERMANY	1951	8	20
GHANA	1957-1987, 2006	A	0
GREECE	1922-2003; 2008	2	2
<i>GUATEMALA</i>	<i>1957-2000</i>		
<i>GUINEA</i>	<i>1987-1995</i>		
<i>HAITI</i>	<i>1956-1971</i>		
HUNGARY	1930	2	2
ICELAND	1967	1	1
INDIA	1947	6	10
INDONESIA	1951	1	1
IRAN	1957	1	1
<i>IRAQ</i>	<i>1983-1996</i>		
IRELAND	1946	2	2
ISRAEL	1951	1	1
ITALY	1919	6	10
<i>IVORY COAST</i>	<i>1975-1996</i>		
JAPAN	1919	8	20
JORDAN	1979	1	1
<i>KENYA</i>	<i>1975-1997</i>		
KOREA	1960	2	2
<i>KOREA /DEM.REP</i>	<i>1967-2000</i>		
<i>LEBANON</i>	<i>1967-2003</i>		
<i>LIBYA</i>	<i>1979-1996</i>		

Table 1 (continued): Member Adhering Bodies of IUGG

MEMBERS	Dates of ADMISSION & TERMINATION	CATEGORY ⁽¹⁾	UNITS ⁽²⁾
LUXEMBOURG	1971	1	1
MACEDONIA, F.Y.R.	1995-2001, 2010	A	0
MADAGASCAR	1967-1995		
MALAYSIA	1967-2002		
MAURITIUS	2003	A	0
MEXICO	1922	2	2
MONACO	1967-2013		
MONGOLIA	1995-2001		
MOROCCO	1924	A	0
MOZAMBIQUE	1983	1	1
MYANMAR (BURMA)	1957-2003		
NEPAL	1975-1987		
NETHERLANDS	1925	4	5
NEW ZEALAND	1927	1	1
NICARAGUA	2014	1	1
NIGERIA	1971	2	2
NORWAY	1923	4	5
PAKISTAN	1952	2	2
PERU	1925-1979, 2000	A	0
PHILIPPINES	1951-2015		
POLAND	1924	2	2
PORTUGAL	1919	2	2
ROMANIA	1930	1	1
RUSSIA (***)	1992	6	10
SAUDI ARABIA	1971-2001, 2012	2	2
SENEGAL	1960-1995		
SERBIA (*)	1996-2006, 2018	A	0
SIERRA LEONE	1967-1983		
SLOVAK REPUBLIC	1993	1	1
SLOVENIA	1994	1	1
SOUTH AFRICA	1924	3	3
SPAIN	1922	5	7
SUDAN	1955-2000		
SWEDEN	1923	4	5
SWITZERLAND	1923	5	7
SYRIA	1948-1995		
TANZANIA	1975-2000		
THAILAND	1923	2	2
TUNISIA	1927-2001		
TURKEY	1949	2	2
UK	1919	8	20
URUGUAY	1924-2000, 2018	A	0
USA	1919	11	35
VENEZUELA	1975-2008		
VIETNAM	1931	1	1
ZIMBABWE	1967-2000		

(1) According to IUGG Statute 12a, there are fourteen categories of membership in the Union, numbered 1 to 14, plus a special category, called A (Associate).

(2) According to IUGG Statute 12b and IUGG By-Law 18 a, for categories 1 to 14, each member country pays annually the number of units of contribution assigned to the category in which it adheres. Associates (Category A) do not pay an annual contribution to the Union.

(*) Adhesion in 1996 under the name of the Federal Republic of Yugoslavia which was changed to Serbia and Montenegro in 2003, and changed to Serbia in 2018.

(**) Adhesion in 1991 under the name Zaire, membership terminated in 1997.

(***) Adhesion in 1954 under the name of the USSR

**Table 2:
Regional Distribution of
Members**

REGION	# OF MEMBERS
Africa	9
Asia	18
Europe	31
North and Central America	5
Oceania	2
South America	7

**Table 3:
Affiliate Members of IUGG**

MEMBERS	ADMISSION
American Geoscience Institute (AGI)	2014
Commission for the Geological Map of the World (CGMW)	2014
International Association for Geoethics (IAGETH)	2014
International Association for Mathematical Geosciences (IAMG)	2015
International Consortium on Landslides (ICL)	2015
Young Earth Scientist (YES) Network	2014

Table 4: IUGG General Assemblies

Assembly	Year	National*	Foreigners*	Total*
I. Rome	1922			
II. Madrid	1924			
III. Prague	1927			
IV. Stockholm	1930	91	240	331
V. Lisbon	1933	40	160	200
VI. Edinburgh	1936	80	264	344
VII. Washington	1939	580	225	805
VIII. Oslo	1948	46	322	368
IX. Bruxelles	1951	60	858	918
X. Rome	1954	163	760	923
XI. Toronto	1957	293	872	1165
XII. Helsinki	1960	121	1254	1375
XIII. Berkeley	1963	1124	814	1938
XIV. Zurich	1967	151	2049	2200
XV. Moscow	1971	1070	1507	2577
XVI. Grenoble	1975	413	2151	2564
Durham, UK	1977		Exceptional G.A.	
XVII. Canberra	1979	469	1475	1944
XVIII. Hamburg	1983	495	2709	3204
XIX. Vancouver	1987	539	3400	3939
XX. Vienna	1991	162	4169	4331
XXI. Boulder	1995	2066	2415	4481
XXII. Birmingham	1999	647	3405	4052
XXIII. Sapporo	2003	1989	2162	4151
XXIV. Perugia	2007	618	3757	4375
XXV. Melbourne	2011	675	2717	3392
XXVI. Prague	2015	143	4088	4231
XXVII. Montreal	2019			

**The figures given do not take into account the accompanying persons.*

Current Officers of IUGG

Bureau of the Union

<i>President:</i>	Michael Sideris	CANADA
<i>Vice-President:</i>	Kathryn Whaler	UK
<i>Secretary General:</i>	Alik Ismail-Zadeh	GERMANY/RUSSIA
<i>Treasurer:</i>	Aksel W. Hansen	DENMARK
<i>Members:</i>	Isabelle Ansoerge	SOUTH AFRICA
	Pierre Hubert	FRANCE
	Chris Rizos	AUSTRALIA

Executive Committee of the Union

According to Article 10 of the Statutes of IUGG, the Executive Committee consists of:

- the Bureau (see above),
- the Immediate Past President of the Union, Harsh Gupta (INDIA)
- the Presidents of the International Associations:

<i>IACS:</i>	Regine Hock	USA
<i>IAG:</i>	Harald Schuh	GERMANY
<i>IAGA:</i>	Eduard Petrovsky	CZECH REPUBLIC
<i>IAHS:</i>	Günter Blöschl	AUSTRIA
<i>IAMAS:</i>	John Turner	UK
<i>IAPSO:</i>	Denise Smythe-Wright	UK
<i>IASPEI:</i>	Thorne Lay	USA
<i>IAVCEI:</i>	Donald Dingwell	GERMANY

Finance Committee of the Union

<i>Chair:</i>	Jan Krynski	POLAND
<i>Members:</i>	Nasser Abou-Ashour	EGYPT
	Corina Risso	ARGENTINA
	Virendra Tiwari	INDIA

Secretariat of IUGG

The Secretariat of IUGG is located in Germany:

Helmholtz Centre Potsdam
GFZ German Research Centre for Geosciences
Telegrafenberg, A17
14473 Potsdam

<i>Executive Secretary/Assistant Secretary General:</i>	Franz G. Kuglitsch	GERMANY
<i>Assistant Executive Secretary</i>	Katrin Gundrum	GERMANY

The Executive Secretary/Assistant Secretary General of IUGG is a non-voting Member of the Bureau of the Union.

IUGG Liaison Officers and Representatives

IUGG Liaison Officers with Intergovernmental Organizations

(Principal Liaisons are marked by **bold**)

<i>The United Nations Geospatial Information Section:</i>	Hermann Drewes	GERMANY
<i>Consultative Committee for Time and Frequency (CCTF):</i>	Richard Biancale	FRANCE
	Claude Boucher	FRANCE

<i>Group on Earth Observations (GEO):</i>	Alik Ismail-Zadeh Claude Boucher Mioara Manda Peter Fox Richard Gross Göran Ekström	GERMANY/RUSSIA FRANCE FRANCE USA USA USA
<i>International Civil Aviation Organization (ICAO):</i>	John Eichelberger Arnau Folch	USA SPAIN
<i>Pan-American Institute of Geography and History (PAIGH):</i>	Laura Sanchez	GERMANY
<i>United Nations Educational, Scientific and Cultural Organization (UNESCO):</i>		
<i>International Hydrological Programme (IHP):</i>	Christophe Cudennec Georg Kaser	FRANCE AUSTRIA
<i>Intergovernmental Oceanographic Commission (IOC):</i>	Stefania Sparnocchia Eugene G. Morozov	ITALY RUSSIA
<i>World Meteorological Organization (WMO):</i>	Arthur Askew Xiao Cunde Alan Thomson Christophe Cudennec Joyce E. Penner Arnau Folch	SWITZERLAND CHINA UK FRANCE USA SPAIN
<i>Partner Advisory Committee (PAC) of the Global Framework for Climate Services (GFCS):</i>	Roger Pulwarty	USA

IUGG Representatives on ICSU Committees and ICSU Regional Offices

<i>Committee on Data for Science and Technology (CODATA):</i>	Alexei Gvishiani Bernd Richter	RUSSIA GERMANY
<i>Committee on Space Research (COSPAR):</i>	Andrew W. Yau Geoffrey Blewitt	CANADA USA
<i>Scientific Committee on Integrated Research on Disaster Risk (IRDR):</i>	Harsh Gupta	INDIA
<i>Scientific Committee on Antarctic Research (SCAR):</i>	Ian Allison John Turner	AUSTRALIA UK
<i>Scientific Committee on Oceanic Research (SCOR):</i>	Denise Smythe-Wright John Turner	UK UK
<i>Scientific Committee on Solar-Terrestrial Physics (SCOSTEP):</i>	Vladimir Kuznetsov	RUSSIA
<i>World Climate Research Programme (WCRP):</i>	Tom Beer Richard Essery	AUSTRALIA UK
<i>World Data System (WDS):</i>	Aude Chambodut Ruth E. Neilan	FRANCE USA
<i>Regional Office for Africa (ROA):</i>	Isabelle Ansorge	SOUTH AFRICA
<i>Regional Office for Asia & the Pacific (ROAP):</i>	Sukanta Roy	INDIA
<i>Regional Office for Latin America and Caribbean (ROLAC):</i>	Jaime U. Fucugauchi	MEXICO

Accredited Delegates to the Council of IUGG

IUGG Council 2016-2019

MEMBER COUNTRY	Name SURNAME
ARGENTINA	Sergio CIMBARO Corina RISSO (Alternate)
AUSTRALIA	Matt KING
AUSTRIA	Norbert HÖGGERL
AZERBAIJAN	Ibrahim GULIYEV Gulam BABAYEV (Alternate)
BELGIUM	Thierry CAMELBEECK
BRAZIL	Roberto Texeira LUZ
BULGARIA	
CANADA	Gordon YOUNG
CHILE	Eduardo CAYUL Aristondo
CHINA	Guoxiong WU
CHINA-TAIPEI	Bor-Shouh HUANG
COLOMBIA	
COSTA RICA	Marino PROTTI
CROATIA	Mirko ORLIC
CZECH REPUBLIC	Eduard PETROVSKY
DENMARK	Søren GREGERSEN
EGYPT	Nasser M. H. ABOU ASHOUR
ESTONIA	Rein RÕÕM
FINLAND	Johanna SALMINEN
FRANCE	Claude BOUCHER
GERMANY	Jürgen MÜLLER
GREECE	Christos ZEREFOS
HUNGARY	József ÁDÁM
ICELAND	Arni SNORRASON
INDIA	Harsh GUPTA
INDONESIA	Priyadi KARDONO
IRAN	
IRELAND	Alun JONES
ISRAEL	Colin PRICE
ITALY	Giuliano PANZA
JAPAN	Setsuya NAKADA

MEMBER COUNTRY	Name SURNAME
JORDAN	
KOREA, Rep.	Sang-Mook LEE
LUXEMBOURG	Tonie VAN DAM
MACEDONIA, F.Y.R.	
MEXICO	
MOZAMBIQUE	Viriato SAMBOCO Manuel F. KAMPINE (Alternate)
NETHERLANDS	Ramon HANSSEN
NEW ZEALAND	David RHOADES
NICARAGUA	
NIGERIA	Dagogo M. J. FUBARA
NORWAY	Oddgeir KRISTIANSEN
PAKISTAN	
POLAND	Jan KRYNSKI
PORTUGAL	
ROMANIA	Constantin S. SAVA
RUSSIA	Alexei D. GVISHIANI
SAUDI ARABIA	
SLOVAK REPUBLIC	Jozef KRISTEK
SLOVENIA	Rudi COP
SOUTH AFRICA	Pieter KOTZE
SPAIN	Lorenzo GARCÍA ASENSIO
SWEDEN	Caroline LECK
SWITZERLAND	Jan SEIBERT
THAILAND	Krit RAMMON Chaiwat PROMTHONG (Alternate)
TURKEY	Osman ALP Mustafa ATA (Alternate)
UNITED KINGDOM	Joanna HAIGH
USA	Stephen R. McNUTT
VIETNAM	Nguyen Xuan ANH

Past Officers of IUGG Bureau

PAST IUGG PRESIDENTS

1919-1933	Charles Lallemand (France)
1933-1936	William Bowie (USA)
1936-1942	Dan La Cour (Denmark)
1946-1948	Bjørn Helland-Hansen (Norway)
1948-1951	Felix A. Vening-Meinesz (Netherlands)
1951-1954	Sidney Chapman (UK)
1954-1957	Kalpathi R. Ramanathan (India)
1957-1960	John T. Wilson (Canada)
1960-1963	Vladimir V. Belousov (USSR)
1963-1967	Joseph Kaplan (USA)
1967-1971	Jean Coulomb (France)
1971-1975	Henry Charnock (UK)
1975-1979	Attia Ashour (Egypt)
1979-1983	George D. Garland (Canada)
1983-1987	Devendra Lal (India)
1987-1991	Vladimir I. Keilis-Borok (USSR)
1991-1995	Helmut Moritz (Austria)
1995-1999	Peter J. Wyllie (USA)
1999-2003	Masaru Kono (Japan)
2003-2007	Uri Shamir (Israel)
2007-2011	Tom Beer (Australia)
2011-2015	Harsh K. Gupta (India)

PAST IUGG VICE-PRESIDENTS

1919-1922	S.A.S. Prince Albert Ie de Monaco William Bowie (USA) Sir William Napier Shaw (UK) M. Tanakadate (Japan)
1922-1948	The Presidents of the Associations
1948-1951	Sydney Chapman (UK) Leason H. Adams (USA)
1951-1954	Gino Cassinis (Italy) Jacob Bjerknes (USA)
1954-1957	John T. Wilson (Canada)
1957-1960	Vladimir V. Belousov (USSR) Weikko Heiskanen (Finland)
1960-1963	Julius Bartels (FRG) Joseph Kaplan (USA)
1963-1967	Keith E. Bullen (Australia) Jean Coulomb (France)
1967-1969	Hisashi Kuno (Japan)
1969-1971	Liviu Constantinescu (Romania)
1971-1975	Attia Ashour (Egypt)
1975-1979	George D. Garland (Canada)
1979-1983	Nikolai V. Shebalin (USSR)
1983-1991	Carl Kisslinger (USA)
1991-1995	Peter J. Wyllie (USA)
1995-2003	Uri Shamir (Israel)
2003-2007	Tom Beer (Australia)
2007-2011	Harsh K. Gupta (India)
2011-2015	Kathryn Whaler (UK)

PAST IUGG SECRETARIES GENERAL

1919-1930	Sir Henry Lyons (UK)
1930-1946	Harold St. J.L. Winterbotham (UK)
1946-1951	James M. Stagg (UK)
1951-1963	Georges R. Laclavère (France)
1963-1973	George D. Garland (Canada)
1973-1991	Paul Melchior (Belgium) *
1991-1999	Georges Balmino (France)
1999-2007	JoAnn Joselyn (USA)

* served as Adjoint Secretary General from 1971-1975

PAST IUGG TREASURERS

1960-1971	Einar Andersen (Denmark)
1971-1979	Elvin Kejlsø (Denmark)
1979-1987	Ole Bedsted Andersen (Denmark)
1987-1999	Søren Gregersen (Denmark)

PAST IUGG BUREAU MEMBERS

1957-1960	George Deacon (UK) J. Wallace Joyce (USA) Chuji Tsuboi (Japan)
1960-1963	M.S. Krishnan (India) Takesi Nagata (Japan)
1963-1967	Bert Bolin (Sweden) Valery A. Troitskaya (USSR)
1967-1971	Liviu Constantinescu (Romania) Thomas Malone (USA) Alexei M. Oboukhov (USSR)
1971-1975	William C. Ackermann (USA) Liviu Constantinescu (Romania) Nikolai V. Shebalin (USSR)
1975-1979	Nikolai V. Shebalin (USSR) Henri Lacombe (France) Carl Kisslinger (USA)
1979-1983	James C.I. Dooge (Ireland) Henri Lacombe (France) Carl Kisslinger (USA)
1983-1987	James C.I. Dooge (Ireland) Vladimir I. Keilis-Borok (USSR) Helmut Moritz (Austria)
1987-1991	Gordon McBean (Canada) Helmut Moritz (Austria) Ye Duzheng (China)
1991-1995	Gordon McBean (Canada) Ye Duzheng (China) Andrei S.Monin (Russia)
1995-1999	Junyong Chen (China) Andrei S. Monin (Russia) Seiya Uyeda (Japan)
1999-2001	Junyong Chen (China) Harsh K. Gupta (India) L.Vere Shannon (South Africa)
2001-2003	Tom Beer (Australia) Junyong Chen (China) Harsh K. Gupta (India)
2003-2007	Yun-tai Chen (China) Harsh K. Gupta (India) Ali A.A. Tealeb (Egypt)
2007-2011	Yun-tai Chen (China) David Jackson (USA) Ali A.A. Tealeb (Egypt)
2011-2015	Isabelle Ansoorge (South Africa) Pierre Hubert (France) Kenji Satake (Japan)

Past Officers of IUGG Finance Committee

PAST FC CHAIRS

1948-1954	John T. Wilson (Canada)
1957-1957	Arthur T. Doodson (UK)
1957-1963	K. Hilding Beij (USA)
1963-1967	M. Doportto (Ireland)
1967-1971	Tauno J. Kukkamäki (Finland)
1971-1975	James M. Stagg (UK)
1975-1979	Charles A. Whitten (USA)
1979-1983	Henry I.S. Thirlaway (UK)
1983-1995	Josep O. Cardus (Spain)
1995-1999	Attia A. Ashour (Egypt)
1999-2003	A. Fred Spilhaus (USA)
2003-2007	Mike Hamlin (UK)
2007-2011	Juan F. Vilas (Argentina)
2011-2016	David Collins (UK)

PAST FC SECRETARIES

1948-1957	K. Hilding Beij (USA)
1957-1960	Martin Goldschmidt (Israel)
1960-1967	Tauno J. Kukkamäki (Finland)
1967-1975	Charles A. Whitten (USA)
1975-1979	Henry I.S. Thirlaway (UK)
1979-1987	Arthur E. Maxwell (USA)
1987-1989	József Somogyi (Hungary)
1989-1999	A. Fred Spilhaus (USA)
1999-2003	Patrick Pinet (France)

PAST FC MEMBERS

1948-1951	Gerardo Dianderas (Peru) Arthur T. Doodson (UK) Jean Vignal (France)
1951-1954	Arthur T. Doodson (UK) Martin Goldschmidt (Israel) Jean Vignal (France)
1954-1957	Martin J. Goldschmidt (Israel) Jean Vignal (France) Fritz Gassmann (Switzerland)
1957-1960	J.M. Rayner (Australia) A. Romana (Spain) Jean Vignal (France)
1960-1963	M. Doportto (Ireland) Jack M. Rayner (Australia) A. Romana (Spain)
1963-1967	Charles A. Whitten (USA) Stanislaw Krynski (Poland) A. Romana (Spain)
1967-1971	Stanislaw Krynski (Poland) James M. Stagg (UK) E. Walser (Switzerland)
1971-1975	Stanislaw Krynski (Poland) E. Walser (Switzerland) G. Yamamoto (Japan)
1975-1979	Stanislaw Krynski (Poland) G. Yamamoto (Japan) P.K. Das (India)
1979-1983	Josep O. Cardus (Spain) Jacub Rais (Indonesia) József Somogyi (Hungary)
1983-1987	Attia A. Ashour (Egypt) Jacub Rais (Indonesia) József Somogyi (Hungary)
1987-1991	Attia A. Ashour (Egypt) Jacub Rais (Indonesia) A. Fred Spilhaus (USA)
1991-1995	Attia A. Ashour (Egypt) A. Fred Spilhaus (USA) Mike J. Hamlin (UK)
1995-1999	Vinod K. Gaur (India) Erwin Groten (Germany) Mike J. Hamlin (UK)
1999-2003	Vinod K. Gaur (India) Erwin Groten (Germany) Mike J. Hamlin (UK)
2003-2007	Brian L.N. Kennett (UK) Kiyoshi Suyehiro (Japan) Juan F. Vilas (Argentina) David Jackson (USA)
2007-2011	David Collins (UK) Jan Krynski (Poland) Kiyoshi Suyehiro (Japan)
2011-2015	Zoltan Hajnal (Canada) Jan Krynski (Poland) David Rhoades (New Zealand)

Union Commissions

Union Commission on Climatic and Environmental Change (CCEC):

www.ccec-iugg.org

<i>Chair:</i>	Tom Beer	AUSTRALIA
<i>Vice-Chair:</i>	Jianping Li	CHINA
<i>Secretary-Treasurer:</i>	Keith Alverson	USA / JAPAN
<i>Executive Committee Members:</i>	Ian Allison	AUSTRALIA
	Harry Bryden	UK
	Domenico Giardini	SWITZERLAND
	Michael C. MacCracken	USA
	Setsuya Nakada	JAPAN
	Dan Rosbjerg	DENMARK
	Stephen Self	USA / UK
	Michael G. Sideris	CANADA
	Makoto Taniguchi	JAPAN
	Tonie Van Dam	LUXEMBOURG
	Guoxiong Wu	CHINA
<i>Co-opted Member:</i>	Serhat Sensoy	TURKEY

Union Commission on Mathematical Geophysics (CMG):

www.iugg.org/about/commissions/cmg.php

<i>Chair:</i>	Yehuda Ben-Zion	USA
<i>Secretary:</i>	Ilya Zaliapin	USA
<i>Vice-Chairs:</i>	Einat Aharonov	ISRAEL
	Claudia Pasquero	ITALY
<i>Past Chair:</i>	Dan Rothman	USA
<i>Executive Committee Members:</i>	Roberto Carniel	ITALY
	Ute Herzfeld	USA
	Shin-chan Han	USA
	Matthias Holschneider	GERMANY
	Dick Peltier	CANADA
	Malcolm Sambridge	AUSTRALIA
	Daniel Schertzer	FRANCE
	Gordon Swaters	USA

Union Commission on Geophysical Risk and Sustainability (GRC):

www.iugg-georisk.org

<i>Chair:</i>	John LaBrecque	USA
<i>Vice-Chairs:</i>	Vyacheslav Gusiakov	RUSSIA
	Alan Thomson	UK
<i>Secretary-Treasurer:</i>	Paula Dunbar	USA
<i>Past Chair:</i>	Kuniyoshi Takeuchi	JAPAN
<i>Executive Committee Members:</i>	Mohsen Ghafory-Ashtiany	IRAN
	Katia Kontar	USA
	Michael Krautblatter	GERMANY
	Joan Marti	SPAIN
	Christa von Hillebrandt-Andrade	USA
	Chun-Chieh Wu	CHINA-TAIPEI
	Harsh Gupta	INDIA
<i>Advisory Board Members:</i>	Gordon McBean	CANADA
	Uri Shamir	ISRAEL
	Tom Beer	AUSTRALIA
<i>Honorary Members:</i>	Alik Ismail-Zadeh	GERMANY
	Ramesh P. Singh	USA

Union Commission on the Study of the Earth's Deep Interior (SEDI):www.sedigroup.org

<i>Chair:</i>	Jonathan Aurnou	USA
<i>Vice-Chair:</i>	Christine Thomas	GERMANY
<i>Secretary:</i>	Michael Bergman	USA
<i>Executive Committee Members at large:</i>	James Badro	FRANCE
	Philippe Cardin	FRANCE
	Ulrich R. Christensen	GERMANY
	Cathy Constable	USA
	Renaud Deguen	FRANCE
	Arwen Deuss	NETHERLAND
	Matthieu Dumberry	CANADA
	Tim Elliott	UK
	Rafael Garcia	FRANCE
	Ed Garnero	USA
	Yumei He	CHINA
	George Helffrich	JAPAN
	Richard Holme	UK
	Gauthier Hulot	FRANCE
	Dominique Jault	FRANCE
	Catherine Johnson	CANADA
	Chris Jones	UK
	Stephane Labrosse	FRANCE
	Thorne Lay	USA
	Guy Masters	USA
Yongxin Pan	CHINA	
Sebastian Rost	UK	
Hisa Shimizu	JAPAN	
Sabine Stanley	CANADA	
Paul Tackley	SWITZERLAND	
Satoru Tanaka (Past Chair)	JAPAN	
Hrvoje Tkalčić	AUSTRALIA	
James Wookey	UK	

Union Commission on Data and Information (UCDI):www.iugg-ucdi.org

<i>Chair:</i>	Satheesh Sheno	INDIA
<i>Vice-Chair:</i>	Anatoly Soloviev	RUSSIA
<i>Executive Committee Members:</i>	Sonia Maria Alves Costa	BRAZIL
	Ellen Clarke	UK
	Michelle Guy	USA
	Robert M. Key	USA
	Silvia Massaro	ITALY
	Yasuhiro Murayama	JAPAN
	Bruce H. Raup	USA
	<i>Co-opted Exec. Committee Members:</i>	Aude Chambodut
	Alena Rybkina	RUSSIA

Union Commission on Planetary Sciences (UCPS):<http://202.127.29.4/geodesy/ucps>

<i>Chair:</i>	Shuanggen Jin	CHINA
<i>Vice-Chairs:</i>	Athena Coustenis	FRANCE
	Jörn Helbert	GERMANY
<i>Secretary/Treasurer:</i>	Scot Rafkin	USA
<i>Executive Committee Members:</i>	Christine Schott Hvidberg	DENMARK
	Michael Purucker	USA
	Fabrizio Capaccione	ITALY
	Philippe Lognonné	FRANCE
	Josè Luis Macías-Vasquez	MEXICO

IUGG Working Group on History

<i>Chair:</i>	Hans Volkert	GERMANY
<i>Vice-Chair:</i>	Claude Boucher	FRANCE
<i>Associations Representatives:</i>	Marc Carey	USA
	József Ádám	HUNGARY
	Edward Cliver	USA
	Maurits Ertsen	NETHERLANDS
	John Gould	UK
	Roger Musson	UK
	Grant Heiken	USA
<i>History of Science Advisors:</i>	Ronald Doel	USA
	Gregory Good	USA

All scientists within IUGG and all historians of science with interest in geophysics are invited to contribute to WGH. Initial contact is to be made via the chairperson.

Inter-Unions Commission

Inter-Unions Commission on the Lithosphere: The International Lithosphere Program (ILP)

www.scl-ilp.org

<i>President:</i>	Hans Thybo	NORWAY / TURKEY
<i>Secretary General:</i>	Magdalena Scheck-Wenderoth	GERMANY
<i>Executive Secretary:</i>	Alexander Rudloff	GERMANY
<i>Bureau Members (Executive):</i>	IUGG: Harsh Gupta	INDIA
	IUGS: Kristine Asch	GERMANY
<i>Advisory Board:</i>	Chair of National Representatives:	
	Alessandro Tibaldi	ITALY
	Özlem Adiyaman Lopes	UNESCO
	Shuwen Dong	CHINA
	Cynthia Ebinger	USA
	Dietmar Mueller	AUSTRALIA
	Hiroshi Sato	JAPAN
	N.N.	AFRICA
	N.N.	LATIN AMERICA
	<i>(Lifetime):</i>	Harsh Gupta
	Mary von Knorring	SWEDEN
<i>(ILP-Fellow):</i>	Jörg Negendank	GERMANY
<i>Past President:</i>	Sierd Cloetingh	NETHERLANDS
<i>Past Secretary General:</i>	Roland Oberhänsli	GERMANY
<i>Honorary President:</i>	Alan Green	SWITZERLAND

IUGG Committees

Outreach Committee

<i>Chair:</i>	Kathryn Whaler	UK
<i>Members:</i>	Val Byfield	UK
	Julia H. Keller	SWITZERLAND
	Sanjay Limaye	USA / INDIA
	Karoly Nemeth	NEW ZEALAND
	Greig Paterson	CHINA
	Franz Kuglitsch (ex-officio)	GERMANY

Capacity Building and Education Committee

<i>Chair:</i>	Thorsten Wagener	UK
<i>Members:</i>	Nasser Abou-Ashour	EGYPT
	Moira Evelina Doyle	ARGENTINA
	Teodoro Georgiadis	ITALY / GREECE
	Bernhard Heck	GERMANY
	Gerhard Navratil	AUSTRIA
	Rrapo Ormeni	ALBANIA
	Feng Tian	CHINA

Honors and Recognition Committee

<i>Chair:</i>	Athena Coustenis	FRANCE
<i>Members:</i>	Lizzette Rodriguez	PUERTO RICO / USA
	Olga Solomina	RUSSIA
	Bernard Wood	UK

Statutes and By-Laws Committee

<i>Chair:</i>	Charles Fierz	SWITZERLAND
<i>Members:</i>	Charles Barton	AUSTRALIA
	Jeffrey Freymueller	USA
	Ajai Manglik	INDIA
	Kathryn Whaler (ex-officio)	UK

Visioning Committee

<i>Chair:</i>	Chris Rizos	AUSTRALIA
<i>Members:</i>	Domenico Giardini	SWITZERLAND
	Franz Kuglitsch	GERMANY
	Andrew Mackintosh	NEW ZEALAND
	Mioara Manda	FRANCE
	Johanna Salminen	FINLAND

Nominating Committee for the XXVII General Assembly

<i>Chair:</i>	Tom Beer	AUSTRALIA
<i>Members:</i>	Michelle Grobbelaar	SOUTH AFRICA
	Kuniyoshi Takeuchi	JAPAN
	Jaime Urrutia Fucugauchi	MEXICO

Resolution Committee for the XXVII General Assembly

<i>Chair:</i>	Harsh Gupta	INDIA
<i>Members:</i>	Zuheir Altamimi	FRANCE
	Ray Cas	AUSTRALIA
	Georgia Destouni	SWEDEN
	Christa von Hillebrandt-Andrade	USA

Site Comparison Committee for the XXVIII General Assembly

<i>Chair:</i>	Eduard Petrovsky	CZECH REPUBLIC
<i>Members:</i>	Xiao Cunde	CHINA
	Laura Gallardo Klenner	CHILE
	Stefania Sparnocchia	ITALY
	Alik Ismail-Zadeh	GERMANY

IUGG Award Committees**Gold Medal Committee**

<i>Chair:</i>	Brian Hoskins	UK
<i>Members:</i>	Jeffrey Freymueller	USA
	Valerie Masson-Delmotte	FRANCE
	Trevor McDougall	AUSTRALIA
	Inez Staciarini Batista	BRAZIL
	Roberto Sulpizio	ITALY
	Zhongliang Wu	CHINA
	Alik Ismail-Zadeh	GERMANY

IUGG Fellow Selection Committee

<i>Chair:</i>	Joyce E. Penner	USA
<i>Members:</i>	Hugo Delgado Granados	MEXICO
	Monika Korte	GERMANY
	Eugene Morozov	RUSSIA
	Kenji Satake	JAPAN
	Chris Rizos	AUSTRALIA

Early Career Scientist Award Committee

<i>Chair:</i>	Jenny Baeseman	USA
<i>Members:</i>	Gregory Foltz	USA
	Salvatore Grimaldi	ITALY
	Futoshi Takahashi	JAPAN
	Thorsten Wagener	UK

INTERNATIONAL ASSOCIATIONS

IUGG comprises eight semi-autonomous International Associations, each responsible for a specific range of topics or themes within the overall scope of the Union's activities and each with a sub-structure discussed below. The International Associations hold Scientific Assemblies such as those since 1969 listed in Table 5.

The eight International Associations are:

Association Internationale des Sciences Cryosphériques (AISC)
International Association of Cryospheric Sciences (IACS)

Association Internationale de Géodésie (AIG)
International Association of Geodesy (IAG)

Association Internationale de Géomagnétisme et d'Aéronomie (AIGA)
International Association of Geomagnetism and Aeronomy (IAGA)

Association Internationale des Sciences Hydrologiques (AISH)
International Association of Hydrological Sciences (IAHS)

Association Internationale de Météorologie et des Sciences de l'Atmosphère (AIMSA)
International Association of Meteorology and Atmospheric Sciences (IAMAS)

Association Internationale pour les Sciences Physiques des Océans (AISPO)
International Association for the Physical Sciences of the Oceans (IAPSO)

Association Internationale de Séismologie et de Physique de l'Intérieur de la Terre (AISPIT)
International Association of Seismology and Physics of the Earth's Interior (IASPEI)

Association Internationale de Volcanologie et de Chimie de l'intérieur de la Terre (AIVCIT)
International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI)

Table 5: Scientific Assemblies of the International Associations

International Association	Year	Meeting Location	Number of Participants
IASPEI	1969	Madrid, Spain	NA
IAGA	1969	Madrid, Spain	475
IAPSO	1970	Tokyo, Japan	602
IASPEI	1973	Lima, Peru	250
IAGA	1973	Kyoto, Japan	613
IAMAP	1974	Melbourne, Australia	596
IAPSO	1974	Melbourne, Australia	596
IAG	1975	Grenoble, France	398
IASPEI	1977	Durham, UK	500
IAVCEI	1977	Durham, UK	500
IAGA	1977	Seattle, USA	950
IAMAP	1977	Seattle, USA	950
IASPEI	1981	London, Canada	448
IAGA	1981	Edinburgh, UK	747
IAMAP	1981	Hamburg, Germany	921
IAG	1982	Tokyo, Japan	200
IAVCEI	1982	Reykjavik, Iceland	190
IAHS	1982	Exeter, UK	530
IAPSO	1982	Halifax, Canada	759
IASPEI	1984	Hyderabad, India	285
IASPEI	1985	Tokyo, Japan	651
IAGA	1985	Praha, Czechoslovakia	994
IAMAP/IAPSO	1985	Hawaii, USA	450
IAHS	1986	Budapest, Hungary	310

Table 5 (continued): Scientific Assemblies of the International Associations

International Association	Year	Meeting Location	Number of Participants
IAPSO	1988	Acapulco, Mexico	543
IAG	1989	Edinburgh, UK	NA
IASPEI	1989	Istanbul, Turkey	611
IAGA	1989	Exeter, UK	1200
IAMAS/IAPSO	1989	Reading, UK	1020
IAHS	1989	Baltimore, MD, USA	440
IASPEI	1990	Nairobi, Kenya	132
IAVCEI	1991	Naples, Italy	800
IAG	1993	Beijing, China	350
IAVCEI	1993	Canberra, Australia	600
IAMAS/IAHS	1993	Yokohama, Japan	450
IAGA	1993	Buenos Aires, Argentina	505
IASPEI	1994	Wellington, New Zealand	483
IAPSO	1995	Hawaii, USA	700
IAG	1997	Rio de Janeiro, Brazil	350
IASPEI	1997	Thessaloniki, Greece	1040
IAVCEI	1997	Puerto Vallarta, Mexico	600
IAGA	1997	Uppsala, Sweden	1200
IAHS	1997	Rabat, Morocco	500
IAMAS/IAPSO	1997	Melbourne, Australia	1100
IAG	2001	Budapest, Hungary	461
IASPEI/IAGA	2001	Hanoi, Vietnam	1078
IAVCEI	2000	Bali, Indonesia	490
IAMAS	2001	Innsbruck, Austria	851
IAHS	2001	Maastricht, Netherlands	400
IAPSO*	2001	Mar del Plata, Argentina	430
IAVCEI	2004	Pucon, Chile	936
IAG/IAPSO*	2005	Cairns, Australia	724
IAGA	2005	Toulouse, France	886
IAHS	2005	Foz de Iguassu, Brazil	459
IAMAS	2005	Beijing, China	840
IASPEI	2005	Santiago, Chile	360
IAVCEI	2008	Reykjavik, Iceland	907
IASPEI	2009	Cape Town, South Africa	347
IAMAS/IAPSO/IACS	2009	Montreal, Canada	1340
IAGA	2009	Sopron, Hungary	832
IAG	2009	Buenos Aires, Argentina	363
IAHS	2009	Hyderabad, India	500
IACS/IAMAS	2013	Davos, Switzerland	950
IAHS/IAPSO/IASPEI	2013	Göteborg, Sweden	1087
IAG	2013	Potsdam, Germany	532
IAGA	2013	Merida, Mexico	459
IAVCEI	2013	Kagoshima, Japan	1069
IACS	2017	Wellington, New Zealand	250
IAG/IASPEI	2017	Kobe, Japan	1107
IAGA/IAMAS/IAPSO	2017	Cape Town, South Africa	1000
IAHS	2017	Port Elizabeth, South Africa	223
IAVCEI	2017	Portland, OR, USA	1400

* With the International Association for Biological Oceanography (IABO)

International Association of Cryospheric Sciences (IACS) Association Internationale des Sciences Cryosphériques (AISC)

www.cryosphericsscience.org

On 4 July 2007, at the XXIVth IUGG General Assembly in Perugia, Italy, the IUGG Council decided to launch the International Association of Cryospheric Sciences (IACS) as the 8th IUGG Association. IACS is now a sister organization to long established Associations such as those for Hydrological Sciences (IAHS), Meteorology and Atmospheric Sciences (IAMAS) and Physical Sciences of the Oceans (IAPSO). The decision by the IUGG Council was mainly reached in recognition of the fact that the study of the Cryosphere has to be seen on equal footing to investigations of other components of the Earth system. With the initiation of IACS, its predecessors, the International Commission for Snow and Ice (ICSI) and the Union Commission on Cryospheric Sciences (UCCS) are superseded.

IACS BUREAU 2017-2019

<i>President:</i>	Regine Hock	USA
<i>Past President:</i>	Charles Fierz	SWITZERLAND
<i>Secretary General:</i>	Andrew Mackintosh	NEW ZEALAND
<i>Vice-Presidents:</i>	Ian Allison	AUSTRALIA
	Stanislav Kutuzov	RUSSIA
	Xiao Cunde	CHINA

IACS DIVISIONS

Division I – Snow and Avalanches:

<i>Head:</i>	Ethan Greene	USA
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Division II –Glaciers and Ice Sheets:

<i>Head:</i>	Liss M. Andreassen	NORWAY
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Division III – Sea Ice, Lake and River Ice:

<i>Head:</i>	Hiroyuki Enomoto	JAPAN
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Division IV – Cryosphere, Atmosphere and Climate:

<i>Head:</i>	Valérie Masson Delmotte	FRANCE
<i>Deputy Head:</i>	Anais Orsi	FRANCE

Division V – Planetary and other Ices of the Solar System:

<i>Head:</i>	Christine Schøtt Hvidberg	DENMARK
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IACS SERVICES

World Glacier Monitoring Service (WGMS):

<i>Director:</i>	Michael Zemp	SWITZERLAND
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JOINT COMMISSIONS

IAVCEI/IACS Commission on Volcano-Ice Interaction

<i>Chair:</i>	Christopher Hamilton	USA
<i>Vice-Chair:</i>	Hugo Delgado Granados	MEXICO
<i>Ex-Officio:</i>	Dave McGarvie	UK

PAST IACS PRESIDENTS

2007-2009	Georg Kaser (Austria)
2009-2013	Ian Allison (Australia)
2013-2017	Charles Fierz (Switzerland)

PAST IACS SECRETARIES GENERAL

2007-2011	Manfred Lange (Germany)
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International Association of Geodesy (IAG) Association Internationale de Géodésie (AIG)

www.iag-aig.org

In April 1862, the “Mitteleuropäische Gradmessung” was initiated by a “preliminary consultation” of representatives of the states of Prussia, Austria and Saxony. It was established at the constituent conference in Berlin, October 1864, as the first international scientific association of significance and expanded to the “Internationale Erdmessung” (Association Géodésique Internationale) in 1886. At the first General Assembly of the IUGG in Rome, May 1922, it became one of the constituent Sections of the Union. It took its present name at the IUGG General Assembly in Stockholm, August 1930.

IAG EXECUTIVE COMMITTEE 2015-2019

The IAG Executive Committee consists of the Bureau, the immediate Past President, the Commission Presidents, the Chair of the Global Geodetic Observing System, the President of the Communication and Outreach Branch, three Representatives of the Services, and two Members at Large.

IAG Bureau:

<i>President:</i>	Harald Schuh	GERMANY
<i>Vice-President:</i>	Zuheir Altamimi	FRANCE
<i>Secretary General:</i>	Hermann Drewes	GERMANY

Immediate Past President:

<i>President 2011-2015:</i>	Chris Rizos	AUSTRALIA
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Commission Presidents:

<i>Commission 1:</i>	Geoffrey Blewitt	USA
<i>Commission 2:</i>	Roland Pail	GERMANY
<i>Commission 3:</i>	Manabu Hashimoto	JAPAN
<i>Commission 4:</i>	Marcelo Santos	CANADA

President of the Inter-Commission Committee on Theory:

<i>ICCT President:</i>	Pavel Novák	CZECH REPUBLIC
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Chair of the Global Geodetic Observing System (GGOS):

Richard Gross	USA
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President of the Communication and Outreach Branch:

József Ádám	HUNGARY
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Representatives of the IAG Services:

Riccardo Barzaghi	ITALY
Ruth Neilan	USA
Axel Nothnagel	GERMANY

IAG Members at Large:

Yamin Dang	CHINA
Maria Cristina Pacino	ARGENTINA

Non-voting Members:

<i>Assistant Secretary:</i>	Franz Kuglitsch	GERMANY
<i>IAG Past Presidents:</i>	Helmut Moritz	AUSTRIA
	Ivan I. Mueller	USA
	Wolfgang Torge	GERMANY
	Fernando Sansó	ITALY
	Gerhard Beutler	SWITZERLAND
	Michael Sideris	CANADA
<i>Past Secretaries General:</i>	Claude Boucher	FRANCE

IAG COMMISSIONS

Commission 1: Reference Frames

President: Geoffrey Blewitt USA
Vice-President Johannes Böhm AUSTRIA

Commission 2: Gravity Field

President: Roland Pail GERMANY
Vice-President Shuanggen Jin CHINA

Commission 3: Earth Rotation and Geodynamics

President: Manabu Hashimoto JAPAN
Vice-President: Cheng-Li Huang CHINA

Commission 4: Positioning and Applications

President: Marcelo Santos CANADA
Vice-President: Allison Kealy AUSTRALIA

IAG INTER-COMMISSION COMMITTEE ON THEORY (ICCT)

President: Pavel Novák CZECH REPUBLIC
Vice-President: Mattia Crespi ITALY

IAG SERVICES

Bureau Gravimétrique International (BGI):

Director: Sylvain Bonvalot FRANCE

Bureau International de Poids et Mesures (BIPM), Time Department:

Director of Department: Patrizia Tavella FRANCE

International Geodynamics and Earth Tide Service (IGETS)

Chair: Hartmut Wziontek GERMANY
Director Central Bureau: Jean-Paul Boy FRANCE

International Centre for Global Earth Models (ICGEM):

Director: Elmas Sinem Ince GERMANY

International Digital Elevation Model Service (IDEMS):

Director: Kevin M. Kelly USA

International DORIS Service (IDS):

Chair Governing Board: Frank Lemoine USA
Director Central Bureau: Laurent Soudarin FRANCE

International Earth Rotation and Reference Systems Service (IERS):

Chair of Directing Board: Brian Luzum USA
Director of Central Bureau: Daniela Thaller GERMANY

International Service for the Geoid (ISG):

President: Mirko Reguzzoni ITALY
Director: Daniela Carrion ITALY

International Gravity Field Service (IGFS):

Chair: Riccardo Barzaghi ITALY
Director of Central Bureau: Georgios Vergos GREECE

International GNSS Service (IGS):

Chair of Governing Board: Gary Johnston AUSTRALIA
Director of Central Bureau: Allison Craddock USA

International Laser Ranging Service (ILRS):

Chair of Governing Board: Guiseppe Bianco ITALY
Director of Central Bureau: Michael Pearlman USA

International Service for Geodesy and Astrometry (IVS):

Chair of Directing Board: Axel Nothnagel GERMANY
Director of Coord. Centre: Dirk Behrend USA

Permanent Service for Mean Sea Level (PSMSL):

Director: Lesley J. Rickards UK

IAG GLOBAL GEODETIC OBSERVING SYSTEM (GGOS)

Chair: Richard Gross USA

Vice-Chair: Ruth Neilan USA

IAG OFFICE

Deutsches Geodätisches Forschungsinstitut (DGFI)

Secretary General: Hermann Drewes GERMANY

Assistant Secretary: Franz Kuglitsch GERMANY

Assistant Treasurer: Wolfgang Küffner GERMANY

IAG COMMUNICATION AND OUTREACH BRANCH

Hungarian Academy of Sciences (HAS) / Budapest University of Technology and Economics (BUTE)

President: József Ádám HUNGARY

Secretary: Szabolcs Rózsa HUNGARY

JOURNAL OF GEODESY

Editor in Chief: Jürgen Kusche GERMANY

IAG SYMPOSIA SERIES

Editor in Chief: Jeff Freymueller USA

Assistant Editor: Laura Sanchez GERMANY

PAST IAG & FORERUNNER PRESIDENTS

1864-1868 Peter Andreas Hansen (Thuringia)
1869-1874 August von Fligely (Austria)
1874-1891 Carlos Ibanez de Ibero (Spain)
1892-1902 Hervé Faye (France)
1903-1917 Léon Bassot (France)
1917-1922 Raul Gautier (Switzerland)
1922-1933 William Bowie (USA)
1933-1945 Felix A. Vening Meinesz (Netherlands)
1945-1951 Walter D. Lambert (USA)
1951-1954 Carl F. Baeschlin (Switzerland)
1954-1957 James de Graaf Hunter (UK)
1957-1960 Gino Cassinis (Italy)
1960-1963 Charles A. Whitten (USA)
1963-1967 Guy Bomford (UK)
1967-1971 Antonio Marussi (Italy)
1971-1975 Yuri D. Boulanger (USSR)
1975-1979 Tauno J. Kukkamäki (Finland)
1979-1983 Helmut Moritz (Austria)
1983-1987 Peter V. Angus-Leppan (Australia)
1987-1991 Ivan I. Mueller (USA)
1991-1995 Wolfgang Torge (Germany)
1995-1999 Klaus-Peter Schwarz (Canada)
1999-2003 Fernando Sansó (Italy)
2003-2007 Gerhard Beutler (Switzerland)
2007-2011 Michael Sideris (Canada)
2011-2015 Chris Rizos (Australia)

PAST CENTRAL BUREAU DIRECTORS

1864-1885 Johann Jacob Baeyer (Prussia/Germany)
1886-1917 Friedrich Robert Helmert (Germany)

PAST PERMANENT SECRETARIES

1886-1900 Adolf Hirsch (Switzerland)
1900-1921 Hendricus G. Van de Sande-Bakhuyzen (Netherlands)

PAST SECRETARIES GENERAL AND CENTRAL BUREAU DIRECTORS

1922-1945 George Perrier (France)
1946-1960 Pierre Tardi (France)
1960-1975 Jean-Jacques Levallois (France)
1975-1991 Michel Louis (France)
1991-1995 Claude Boucher (France)
1995-2007 Carl Christian Tscherning (Denmark)

International Association of Geomagnetism and Aeronomy (IAGA) Association Internationale de Géomagnétisme et d'Aéronomie (AIGA)

www.iugg.org/IAGA

At the First IUGG General Assembly (Rome, 1922), the *Section de Magnétisme et Electricité Terrestres* became one of the constituent *sections* of the Union. At the IV IUGG General Assembly (Stockholm, 1930), it became the *International Association of Terrestrial Magnetism and Electricity*. It took its present name at the X IUGG General Assembly (Rome, 1954).

IAGA EXECUTIVE COMMITTEE 2015-2019

<i>President:</i>	Eduard Petrovsky	CZECH REPUBLIC
<i>Vice-President:</i>	Monika Korte	GERMANY
<i>Secretary General:</i>	Mioara Manda	FRANCE
<i>Past President:</i>	Kathryn Whaler	UK
<i>Members:</i>	Inez S. Batista	BRAZIL
	Archana Bhattacharyya	INDIA
	Brian J. Fraser	AUSTRALIA
	Pieter Kotze	SOUTH AFRICA
	Renata Lukianova	RUSSIA
	Alan Thomson	UK
	Andrew Yau	CANADA

IAGA DIVISIONS

IAGA Division I – Internal Magnetic Fields

<i>Chair:</i>	Cathy Constable	USA
<i>Co-Chair:</i>	Harald Boehnel	MEXICO

Working Group I-1: Theory of Planetary Magnetic Fields

<i>Chair:</i>	Ján Šimkanin	CZECH REPUBLIC
<i>Co-Chair:</i>	Nicolas Gillet	FRANCE

Working Group I-2: Palaeomagnetism

<i>Chair:</i>	Fabio Florindo	ITALY
<i>Co-Chair:</i>	Julie Carlut	FRANCE

Working Group I-3: Rock- and Environmental Magnetism

<i>Chair:</i>	Neli Jordanova	BULGARIA
<i>Co-Chair:</i>	Ramon Egli	AUSTRIA

IAGA Division II – Aeronomical Phenomena

<i>Chair:</i>	Paulo Roberto Fagundes	BRAZIL
<i>Co-Chair:</i>	Christoph Jacobi	GERMANY

Working Group II-A: Electrodynamics of the Middle Atmosphere

<i>Chair:</i>	Martin Füllekrug	UK
<i>Co-Chair:</i>	Mitsuteru Sato	JAPAN

Working Group II-C: Meteorological Effects on the Ionosphere

<i>Chair:</i>	Petra Knizova	CZECH REPUBLIC
<i>Co-Chairs:</i>	Erdal Yigit	TURKEY
	Christina Arras	GERMANY

Working Group II-D: External Forcing of the Middle Atmosphere

<i>Chair:</i>	Christoph Jacobi	GERMANY
<i>Co-Chairs:</i>	Katja Matthes	GERMANY
	Nick Pedatella	USA

Working Group II-E: Ionospheric Irregularities, Fields and Waves

<i>Chair:</i>	Maxim Klimenko	RUSSIA
<i>Co-Chair:</i>	Biqiang Zhao	CHINA

Working Group II-F: Long-term Trends in the Mesosphere, Thermosphere and Ionosphere (IAGA/ICMA/SCOSTEP)

Chair: Gufran Beig INDIA
Co-Chair: Jan Lastovicka CZECH REPUBLIC

IAGA/URSI Working Group: (VERSIM) VLF/ELF Remote Sensing of the Ionosphere and Magnetosphere

IAGA Chair: Jacob Bortnik USA
Co-Chair: Mark Clilverd UK

IAGA Division III – Magnetospheric Phenomena

Chair: Clare E. J. Watt UK
Co-Chair: Simon Wing USA

IAGA Division IV – Solar Wind & Interplanetary Field

Chair: Spiros Patsourakos GREECE
Co-Chair: Bogdan Hnat UK

IAGA Division V – Geomagnetic Observatories, Surveys & Analysis

Chair: Aude Chambodut FRANCE
Co-Chair: Kusumita Arora INDIA

Working Group V-OBS: Geomagnetic Observation

Chair: Arnaud Chulliat USA
Co-Chair: Jürgen Matzka GERMANY

Working Group V-MOD: Geomagnetic Field Modeling

Chair: Erwan Thébault FRANCE
Co-Chair: Patrick Alken USA

Working Group V-DAT: Geomagnetic Data and Indices

Chair: Masahito Nosé JAPAN
Co-Chair: Ellen Clarke UK

IAGA Division VI – Electromagnetic Induction in the Earth and Planetary Bodies

Chair: Nikolay Palshin RUSSIA
Co-Chair: Ute Weckmann GERMANY

IAGA Inter-divisional Commissions

Inter-divisional Commission on Developing Countries

Chair: S. Gurubaran INDIA
Co-Chairs: Marta M. Zossi ARGENTINA
 K. Veeraswamy INDIA

Inter-divisional Commission on History

Chair: Anatoly Soloviev RUSSIA
Co-Chair: Justin Mabie USA

Inter-divisional Commission on Education and Outreach

Chair: Edgar A. Bering, III USA
Co-Chair: Barbara Leichter AUSTRIA

Inter-divisional Commission on Space Weather

Chair: Antti Pulkkinen USA
Co-Chair: Colin Waters AUSTRALIA

IAGA - Joint Interassociation Working Groups

IAGA/IASPEI/IAVCEI Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)

www.emsev-iugg.org/emsev

Chair: Jacques Zlotnicki FRANCE
Vice-Chair: Malcolm Johnston USA
Secretary: Toshiyasu Nagao JAPAN
IAGA Liaison: Jann-Yenq Liu CHINA-TAIPEI
IAGA WG I-2 Liaison: Tirumalachetty Harinarayana INDIA

IASPEI /IAGA International Ocean Network (ION)

<i>Chair:</i>	Yoshiyuki Kaneda	JAPAN
<i>IAGA Liaison:</i>	Hisashi Utada	JAPAN

PAST IAGA PRESIDENTS

1919-1922	Aikitsu Tanakadate (Japan)
1922-1927	Charles Chree (UK)
1927-1930	Louis A. Bauer (USA)
1930-1948	John A. Fleming (USA)
1948-1951	Sydney Chapman (UK)
1951-1954	Jean Coulomb (France)
1954-1957	Julius Bartels (F.R. Germany)
1957-1960	Joseph Kaplan (USA)
1960-1963	Viggo Laursen (Denmark)
1963-1967	Marcelle Nicolet (Belgium)
1967-1971	Takesi Nagata (Japan)
1971-1975	Valery A. Troitskaya (USSR)
1975-1979	Juan G. Roederer (USA)
1979-1983	Keith D. Cole (Australia)
1983-1987	Denis I. Gough (Canada)
1987-1991	Roger E. Gendrin (France)
1991-1995	D. J. Williams (USA)
1995-1999	Masaru Kono (Japan)
1999-2003	David J. Kerridge (UK)
2003-2007	Charles Barton (Australia)
2007-2011	Eigil Friis-Christensen (Denmark)
2011-2015	Kathryn Whaler (UK)

PAST IAGA GENERAL SECRETARIES

1919-1927	Louis A. Bauer (USA)
1927-1933	Charles Maurain (France)
1933-1936	Dan La Cour (Denmark)
1936-1939	A.H.R. Goldie (UK)
1939-1951	J. Wallace Joyce (USA)
1951-1957	Viggo Laursen (Denmark)
1957-1963	Josep O. Cardus (Spain)
1963-1975	Leroy Alldredge (USA)
1975-1983	Naoshi Fukushima (Japan)
1983-1995	Michael Gadsden (UK)
1995-1999	JoAnn Joselyn (USA)
1999-2001	Herbert W. Kroehl (USA)
2001-2009	Bengt Hultqvist (Sweden)

International Association of Hydrological Sciences (IAHS) Association Internationale des Sciences Hydrologiques (AISH)

<http://iahs.info>

At the First IUGG General Assembly (Rome, 1922), the *Section d'Hydrologie Scientifique* became one of the constituent *sections* of the Union. At the IV IUGG General Assembly (Stockholm, 1930) it became the *International Association of Scientific Hydrology*. It took its present name at the XV IUGG General Assembly (Moscow, 1971).

IAHS OFFICERS, 2017-2019

<i>President:</i>	Günter Blöschl	AUSTRIA
<i>Past President</i>	Hubert Savenije	NETHERLANDS
<i>Vice-Presidents:</i>	Georgia (Gia) Destouni	SWEDEN
	Elango Lakshmanan	INDIA
	Eric Servat	FRANCE
<i>Honorary Vice-President:</i>	Jun Xia	CHINA
<i>Secretary General:</i>	Christophe Cudennec	FRANCE
<i>Treasurer:</i>	Cate Gardner	UK
<i>Editors:</i>	Attilio Castellarin	ITALY
	Demetris Koutsoyiannis	GREECE
	Ross Woods	UK
<i>Chair IAHS Ltd.:</i>	Cate Gardner	UK

IAHS INTERNATIONAL COMMISSIONS

International Commission on Continental Erosion (ICCE)

<i>President:</i>	Adrian Collins	UK
<i>Vice-Presidents:</i>	Kazimierz Banasik	POLAND
	Sergey Chalov	RUSSIA
	Dieter Rickenmann	SWITZERLAND
<i>Secretary:</i>	Paolo Porto	ITALY
<i>Past President:</i>	Michael Stone	CANADA

International Commission on Coupled Land-Atmosphere Systems (ICCLAS)

<i>President:</i>	Harald Kunstmann	GERMANY
<i>Vice-Presidents:</i>	Chris White	AUSTRALIA
	Kaniska Mallick	LUXEMBOURG
	Richard Petrone	CANADA
<i>Secretary:</i>	Koray K. Yilmaz	TURKEY
<i>Past President:</i>	Eva Boegh	DENMARK

International Commission on Groundwater (ICGW)

<i>Vice-Presidents:</i>	Corinna Abesser	UK
	Gunnar Nützmann	GERMANY
	Jichun Wu	CHINA
<i>Secretary:</i>	Laura Foglia	GERMANY
<i>Past President:</i>	Aldo Fiori	ITALY

International Commission on Remote Sensing (ICRS)

<i>President:</i>	Yangbo Chen	CHINA
<i>Vice-Presidents:</i>	Chris Hopkinson	CANADA
	Maria Jose Polo Gomez	SPAIN
	Zhongbo (Bob) Su	NETHERLANDS
<i>Secretary:</i>	Gilles Boulet	FRANCE
<i>Past President:</i>	Christopher Neale	USA

International Commission on Statistical Hydrology (ICSH)

<i>President:</i>	Ashish Sharma	AUSTRALIA
<i>Vice-Presidents:</i>	Ebru Eris	TURKEY
	Yuanfang Chen	CHINA
	Krzysztof Kochanek	POLAND
<i>Secretary:</i>	Elena Volpi	ITALY
<i>Past President:</i>	Salvatore Grimaldi	ITALY

International Commission on Snow and Ice Hydrology (ICSIH)

<i>President:</i>	Tobias Jonas	SWITZERLAND
<i>Vice-Presidents:</i>	Tim Link	USA
	Sebastian Mernild	CHILE
	Melody Sandells	UK
<i>Secretary:</i>	Alexander Gelfan	RUSSIA
<i>Past President:</i>	Danny Marks	USA

International Commission on Surface Water (ICSW)

<i>President:</i>	Gil Mahé	FRANCE
<i>Vice-Presidents:</i>	Ennio Ferrari	ITALY
	David Hannah	UK
	Thomas Skaugen	NORWAY
<i>Secretary:</i>	Yan Huang	CHINA
<i>Past President:</i>	Hafzullah Aksoy	TURKEY

International Commission on Tracers (ICT)

<i>President:</i>	Christine Stumpp	GERMANY
<i>Vice-Presidents:</i>	Maki Tsujimura	JAPAN
	Zhonghe Pang	CHINA
	Josep Mas-Pla	SPAIN
<i>Secretary:</i>	Przemyslaw Wachniew	POLAND

International Commission on Water Quality (ICWQ)

<i>President:</i>	Wouter Buytaert	UK
<i>Vice-Presidents:</i>	A.B. Gupta	INDIA
	Matt Hipsey	AUSTRALIA
	Xiaohong Chen	CHINA
<i>Secretary:</i>	Per Stålnacke	NORWAY
<i>Past President:</i>	Kate Heal	UK

International Commission on Water Resources Systems (ICWRS)

<i>President:</i>	Andreas Schumann	GERMANY
<i>Vice-Presidents:</i>	Barry Croke	AUSTRALIA
	Magdalena Rogger	AUSTRIA
	Zongxue Xu	CHINA
<i>Secretary:</i>	Alberto Viglione	AUSTRIA
<i>Past President:</i>	Alberto Montanari	ITALY

IAHS WORKING GROUPS

“Panta Rhei – Everything Flows” - Change in Hydrology and Society

<i>Chair:</i>	Giuliano Di Baldassare	SWEDEN
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Education in Hydrological Sciences

<i>Chair:</i>	Eric Servat	FRANCE
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MOXXI (Measurements and Observations in the XXIst century)

<i>Chair:</i>	Flavia Tauro	ITALY
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CANDHY (Citizen AND Hydrology)

<i>Chair:</i>	Flavia Tauro	ITALY
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PAST IAHS PRESIDENTS

1922-1933 E. Wade (UK)
1933-1936 Jan Smetana (Czechoslovakia)
1936-1947 Otto Lütschg (Switzerland)
1947-1948 Gustaf Slettenmark (Sweden)
1948-1951 Merrill Bernard (USA)
1951-1957 Johannes T. Thijssse (Netherlands)
1957-1960 Harold G. Wilm (USA)
1960-1963 W. Friedrich (F.R. Germany)
1963-1967 Adriaan Volker (Netherlands)
1967-1970 Károly Szeztay (Hungary)
1970-1971 William C. Ackermann (USA)
1971-1975 Jean Rodier (France)
1975-1979 James C.I. Dooge (Ireland)
1979-1983 Mark F. Meier (USA)
1983-1987 György Kovacs (Hungary)
1987-1991 Vit Klemes (Canada)
1991-1995 Uri Shamir (Israel)
1995-2001 John C. Rodda (UK)
2001-2005 Kuniyoshi Takeuchi (Japan)
2005-2009 Arthur Askew (Australia)
2009-2013 Gordon Young (Canada)
2013-2017 Hubert Savenije (Netherlands)

PAST IAHS SECRETARIES GENERAL

1922-1933 Giovanni Magrini (Italy)
1933-1947 Frédéric Diénert (France)
1947-1948 Auguste Vibert (France)
1948-1971 Léon J. Tison (Belgium)
1971-1975 György Kovacs (Hungary)
1975-1979 Jean Rodier (France)
1979-1987 John C. Rodda (UK)
1987-1995 Henny J. Colenbrander (Netherlands)
1995-2000 Gordon J. Young (Canada)
2000-2011 Pierre Hubert (France)

International Association of Meteorology and Atmospheric Sciences (IAMAS) Association Internationale de Météorologie et des Sciences de l'Atmosphère (AIMSA)

www.iamas.org

Right at the start of IUGG in July 1919, the *Section de Météorologie* became one of the constituent *sections* of the Union. At the fourth IUGG General Assembly (Stockholm, 1930) it became the *International Association of Meteorology*. It was renamed *International Association of Meteorology and Atmospheric Physics* at the eleventh IUGG General Assembly (Toronto, 1957) and, more general, *International Association of Meteorology and Atmospheric Sciences* in 1993.

IAMAS EXECUTIVE COMMITTEE 2015-2019

<i>President:</i>	John Turner	UK
<i>Vice-Presidents:</i>	Joyce E. Penner	USA
	Laura Gallardo Klenner	CHILE
<i>Past President:</i>	Athena Coustenis	FRANCE
<i>Secretary General:</i>	Teruyuki Nakajima	JAPAN
<i>Deputy Secretary General:</i>	Steven Ackerman	USA
<i>Assistant Secretaries General</i> <i>(not voting):</i>	Yoshinobu Sasaki	JAPAN
	Nozomi Tomizawa	JAPAN
	Miyuki Miyazaki	JAPAN
<i>Members at large:</i>	Lisa Alexander	AUSTRALIA
	Keith Alverson	USA / JAPAN
	Iracema Cavalcanti	BRAZIL
	Daren Lu	CHINA
	Colin Price	ISRAEL
<i>Commission presidents (ex officio):</i>	see below	see below

IAMAS COMMISSIONS

Atmospheric Chemistry and Global Pollution (ICACGP)

www.icacgp.org

<i>President:</i>	John P. Burrows	GERMANY
<i>Vice-President:</i>	Melita Keywood	AUSTRALIA
<i>Secretary:</i>	James R. Drummond	CANADA

Atmospheric Electricity (ICAE)

<http://icae.jp>

<i>President:</i>	Dahong Wang	CHINA
<i>Secretary:</i>	Tomoo Ushio	JAPAN

Climate (ICCL)

www.iccl-iamas.net

<i>President:</i>	Neil Holbrook	AUSTRALIA
<i>Secretary:</i>	Jianping Li	CHINA

Clouds and Precipitation (ICCP)

www.iccp-iamas.org

<i>President:</i>	Andrea Flossmann	FRANCE
<i>Vice-President:</i>	Greg McFarquhar	USA
<i>Secretary:</i>	Darrel Baumgardner	MEXICO

ICCP - Committee on Nucleation and Atmospheric Aerosols

www.icnaa.org

<i>Chair:</i>	Barbara N. Hale	USA
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Dynamic Meteorology (ICDM)

<http://icdm.atm.ucdavis.edu/ICDM.html>

<i>President:</i>	Richard Grotjahn	USA
<i>Vice-President:</i>	Thomas Spengler	NORWAY
<i>Secretary:</i>	Nili Harnik	ISRAEL

Middle Atmosphere (ICMA)

www.icma-iamas.org

<i>President:</i>	Elisa Manzini	GERMANY
<i>Vice-President:</i>	Bernd Funke	SPAIN

Ozone (IO3C)

www.io3c.org

<i>President:</i>	Sophie Godin-Beekmann	FRANCE
<i>Vice-President:</i>	Paul A. Newman	USA
<i>Secretary:</i>	Irina Petropavlovskikh	USA

Planetary Atmospheres and their Evolution (ICPAE)

http://icpae.iaps.inaf.it/

<i>President:</i>	Sanjay Limaye	USA
<i>Vice-President:</i>	Feng Tian	CHINA
<i>Secretary:</i>	Christina Plainaki	ITALY

Polar Meteorology (ICPM)

www.icpm-iamas.aq

<i>President:</i>	Tom Lachlan-Cope	UK
<i>Secretary:</i>	Matthew Lazzara	USA

Radiation (IRC)

www.irc-iamas.org

<i>President:</i>	Byung-Ju Sohn	KOREA
<i>Vice-President:</i>	Peter Pilewskie	USA
<i>Secretary:</i>	Marcia Akemi Yamasoe	BRAZIL

PAST IAMAS PRESIDENTS

1919-1930	William Napier Shaw (UK)
1930-1936	Axel Wallen (Sweden)
1936-1948	Sidney Chapman (UK)
1948-1951	Jacob Bjerknes (USA)
1951-1954	Kalpathi R. Ramanathan (India)
1954-1957	Carl-Gustaf Rossby (Sweden)
1957-1960	Jacques van Mieghem (Belgium)
1960-1963	Horace R. Byers (USA)
1963-1967	Alexei M. Oboukhov (USSR)
1967-1971	Reginald C. Sutcliffe (UK)
1971-1975	Sigmund Fritz (USA)
1975-1979	Christian Junge (F.R.Germany)
1979-1983	Warren L. Godson (Canada)
1983-1987	Hans-Jürgen Bolle (Austria)
1987-1991	G. Brian Tucker (Australia)
1991-1995	Brian J. Hoskins (UK)
1995-1999	Robert A. Duce (USA)
1999-2003	Huw C. Davies (Switzerland)
2003-2007	Michael C. MacCracken (USA)
2007-2011	Guoxiong Wu (China)
2011-2015	Athena Coustenis (France)

PAST IAMAS SECRETARIES GENERAL

1919-1922	Charles F. Marvin (USA)
1922-1927	Filippo Eredia (Italy)
1927-1936	Philippe Wehrlé (France)
1936-1948	Jacob Bjerknes (USA)
1948-1954	Jacques van Mieghem (Belgium)
1954-1960	Reginald C. Sutcliffe (UK)
1960-1975	Warren L. Godson (Canada)
1975-1987	Stanley Ruttenberg (USA)
1987-1995	Michael Kuhn (Austria)
1995-2007	Roland List (Canada)
2007-2015	Hans Volkert (Germany)

International Association for the Physical Sciences of the Oceans (IAPSO) Association Internationale pour les Sciences Physiques des Océans (AISPO)

<http://iapso.iugg.org>

At the First IUGG General Assembly (Rome, 1922), the *Section d'Océanographie* became one of the constituent Sections of the Union. At the IV IUGG General Assembly (Stockholm, 1930) it became the *International Association of Physical Oceanography*. It took its present name at the XIV IUGG General Assembly (Zurich, 1967).

IAPSO BUREAU 2015 – 2019

<i>President:</i>	Denise Smythe-Wright	UK
<i>Past President:</i>	Eugene G. Morozov	RUSSIA
<i>Secretary General:</i>	Stefania Sparnocchia	ITALY
<i>Treasurer:</i>	Ken Ridgway	AUSTRALIA

IAPSO EXECUTIVE COMMITTEE 2015 – 2019

<i>Vice-Presidents:</i>	Isabelle Ansorge	SOUTH AFRICA
	Trevor McDougall	AUSTRALIA
<i>Members:</i>	Agatha de Boer	SWEDEN
	Toshiyuki Hibiya	JAPAN
	Chris Meinen	USA
	Satheesh Chandra Shenoi	INDIA
	Hans van Haren	NETHERLANDS
	Christa von Hillebrandt-Andrade	USA

IAPSO COMMISSIONS

Mean Sea Level & Tides

<i>President:</i>	Gary T. Mitchum	USA
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JOINT COMMISSIONS & WORKING GROUPS

IAPSO/IASPEI/IAVCEI Joint Tsunami Commission

<i>Chair:</i>	Vasily V. Titov	USA
<i>Vice-Chairs:</i>	Fumihiko Imamura	JAPAN
	Ahmet Yalciner	TURKEY
<i>Secretary:</i>	Phil Cummins	AUSTRALIA
<i>IAPSO Representative:</i>	Efim Pelinovsky	RUSSIA

SCOR/IAPWS/IAPSO Joint Committee on the Properties of Seawater, JCS

<i>Chair:</i>	Rich Pawlowicz	CANADA
<i>Vice-Chairs:</i>	Rainer Feistel	GERMANY
	Steffen Seitz	GERMANY

SERVICES

Permanent Service for Mean Sea Level (to be affiliated to the World Data System of ICSU)

www.psmsl.org

<i>Director:</i>	Lesley J. Rickards	UK
<i>IAPSO Liaison:</i>	Philip L. Woodworth	UK

IAPSO Standard Seawater Service

<i>Director:</i>	Richard Williams	UK
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PAST IAPSO PRESIDENTS

1919-1922 S.A.S. Prince Albert 1^{er} (Monaco)
1924-1930 Odón de Buen (Spain)
1930-1936 Martin Knudsen (Denmark)
1936-1946 Bjørn Helland-Hansen (Norway)
1946-1951 Harald U. Sverdrup (Norway)
1951-1954 Joseph Proudman (UK)
1954-1960 Håkon Mosby (Norway)
1960-1963 George E.R. Deacon (UK)
1963-1967 Roger Revelle (USA)
1967-1970 Günter Dietrich (F.R. Germany)
1970-1975 Henri Lacombe (France)
1975-1979 Robert W. Stewart (Canada)
1979-1983 Devendra Lal (India)
1983-1987 Wolfgang M. Krauss (F.R. Germany)
1987-1991 James J. O'Brien (USA)
1991-1995 Robin D. Muench (USA)
1995-1999 L.Vere Shannon (South Africa)
1999-2003 Paola Rizzoli (Italy/USA)
2003-2007 Shiro Imawaki (Japan)
2007-2011 Lawrence Mysak (Canada)
2011-2015 Eugene G. Morozov (Russia)

PAST IAPSO SECRETARIES GENERAL

1919-1930 Giovanni Magrini (Italy)
1930-1933 Rolf Witting (Finland)
1933-1948 Joseph Proudman (UK)
1948-1954 Håkon Mosby (Norway)
1954-1957 Richard H. Fleming (USA)
1957-1963 Börje Kullenberg (Sweden)
1963-1967 Ilmo Hela (Finland)
1967-1970 Arthur E. Maxwell (USA)
1970-1987 Eugene C. LaFond (USA)
1987-1995 Robert E. Stevenson (USA)
1995-2007 Fred E. Camfield (USA)
2007-2015 Johan Rodhe (Sweden)

International Association of Seismology and Physics of the Earth's Interior (IASPEI) Association Internationale de Séismologie et de Physique de l'Intérieur de la Terre (AISPIT)

www.iaspei.org

At the Sixth International Congress of Geography (London, 1895), Professor G. Gerland (Germany) pointed out the necessity of an international cooperation in seismology. At the Seventh Congress (Berlin, 1899) a *Commission séismologique permanente* was created. The first meeting of the Commission was held in Strasbourg in 1901 under the name of *Première Conférence Séismologique Internationale*. Subsequent conferences were held in Strasbourg (1903) and Berlin (1905). During the Strasbourg meeting, an international convention had been drafted to form the *Association Internationale de Séismologie* by signatures of member states. After being signed by 18 states the convention came in power on 1 April 1904. It consisted of a permanent *Bureau* located in Strasbourg, *General Assemblies* and a *Commission Permanente*. The *Commission Permanente* was formed during the Berlin conference and met in Rome (1906), The Hague (1907), Zermatt (1910), Manchester (1911), and Strasbourg (1922). General Assemblies were held jointly in The Hague, Manchester, and Strasbourg. The Association was dissolved by the Strasbourg General Assembly. At the first IUGG General Assembly (Rome, 1922), seismology became one of the constituent Sections of the Union. It changed its name to *International Association of Seismology* at the IV IUGG General Assembly (Stockholm, 1930). It took its present name at the IX IUGG General Assembly (Bruxelles, 1951). For a detailed account of the history of the International Association of Seismology and Physics of the Earth's Interior, see: J.H. Hodgson, *Our Association, its Past as a Guide to its Future*, published in *Comptes Rendus de l'AISPIT*, n15, Première Partie, pp. 12-28, *Fifty Years of the International Association of Seismology (1901-1951)* by J.-P. Rothé (18 pages), and *International Seismology* by R.D. Adams (10 pages) in *International Handbook of Earthquake & Engineering Seismology* (ed. by Willie Lee et al., 2002).

IASPEI BUREAU 2015 – 2019

<i>President:</i>	Thorne Lay	USA
<i>First Vice-President:</i>	Kenji Satake	JAPAN
<i>Second Vice-President:</i>	Michelle Grobbelaar	SOUTH AFRICA
<i>Secretary General/Treasurer:</i>	Johannes Schweitzer	NORWAY

IASPEI EXECUTIVE COMMITTEE 2015 – 2019

<i>Members:</i>	Marcelo Assumpção	BRAZIL
	Li Li	CHINA
	Russell Pysklywec	CANADA
	Dmitry Storchak	UK
<i>Past President:</i>	Domenico Giardini	SWITZERLAND

IASPEI COMMISSIONS

Commission on Tectonophysics and Crustal Structure

<i>Co-Chairs:</i>	Uli Achauer	FRANCE
	Mian Liu	USA

Task Group on Active Monitoring

<i>Chair:</i>	Mineo Kumazawa	JAPAN
<i>Co-Chairs:</i>	Victor Seleznev	RUSSIA
	Junzo Kasahara	JAPAN

Task Group on Seismic Imaging of the Lithosphere

<i>Chair:</i>	Walter D. Mooney	USA
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Task Group on World Stress Map Project

<i>Chair:</i>	Oliver Heidbach	GERMANY
---------------	-----------------	---------

Commission on Earthquake Hazard, Risk & Strong Ground Motion (SHR)

<i>Chair:</i>	Gary Gibson	AUSTRALIA
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Working Group on Earthquake Predictability

<i>Co-Chairs:</i>	David D. Rhoades	NEW ZEALAND
	David Jackson	USA

IASPEI/IAEE Joint Working Group on Effects of Surface Geology on Strong Ground Motion

Co-Chairs: Hiroshi Kawase JAPAN
Jacobó Bielak USA

ASC/SHR Joint Working Group on Seismic Hazard & Risk Assessment for Asian-Pacific Regions

Co-Chairs: Fabio Romanelli ITALY
Gary Gibson AUSTRALIA

Working Group on Earthquake Loss Estimates, Real-Time and Scenario Mode Worldwide

Chair: Max Wyss SWITZERLAND

Commission on Earth Structure & Geodynamics

Co-Chairs: George Helffrich JAPAN
Allen McNamara USA

Working Group on Reference Earth Models

Chair: Gabi Laske USA

Commission on Seismological Observation & Interpretation (CoSOI)

Chair: Torsten Dahm GERMANY

Working Group on Seismic Scattering & Heterogeneity

Chair: Hisashi Nakahara JAPAN

Working Group on Utilization of Global 3-D Models for Seismic Observatory Applications

Chair: Steve C. Myers USA

Working Group on Magnitude Measurements

Chair: Domenico Di Giacomo UK

Working Group on New Manual of Seismological Observatory Practice

Chair: Torsten Dahm GERMANY

Working Group on Triggered and Induced Seismicity

Chair: Stanislaw Lasocki POLAND

Working Group on Historical Seismicity

Co-Chairs: Paola Albini ITALY
Kenji Satake JAPAN

Working Group on Reference Events for Improved Locations

Chair: Kostas Lentas UK

Working Group on IASPEI Seismic Bulletin Format

Chair: James Harris UK

Working Group on Seismic Moment Tensors

Chair: Torsten Dahm GERMANY

Commission on Earthquake Generation Process - Physics, Modelling and Monitoring for Forecast

Chair: Eleftheria Papadimitriou GREECE

Commission on Earthquake Source Mechanics

Chair: Satoshi Ide JAPAN

Joint IAG-IASPEI Sub-Commission on Seismo_Geodesy

Chair: TBD

Commission on Education & Outreach

Co-Chairs: Raju Sarkar BHUTAN
TBD

IASPEI REGIONAL COMMISSIONS

European Seismological Commission (ESC)

www.esc-web.org

<i>President:</i>	María José Jiménez	SPAIN
<i>Vice-President:</i>	Nicholas Voulgaris	GREECE
<i>Secretary General:</i>	Stefano Parolai	GERMANY
<i>Assistant Secretary:</i>	Päivi Mäntyniemi	FINLAND
<i>Past President:</i>	Ina Cčić	SLOVENIA

Asian Seismological Commission (ASC)

www.asc-iaspei.org

<i>President:</i>	Paramesh Banerjee	SINGAPORE
<i>First Vice-President:</i>	Ruben Tatevossian	RUSSIA
<i>Second Vice-President:</i>	Toshiaki Yokoi	JAPAN
<i>Secretary General:</i>	Li Li	CHINA

African Seismological Commission (AfSC)

www.afsc-web.org.za

<i>President:</i>	Mustapha Meghraoui	ALGERIA/FRANCE
<i>First Vice-President:</i>	Paulina Amponsah	GHANA
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<i>Vice-Chair:</i>	Massimo Verdoya	ITALY
<i>Past Chair & IASPEI Representative:</i>	Yuri Popov	RUSSIA
<i>Secretary:</i>	Sukanta Roy	INDIA
<i>Vice-Secretary:</i>	Graeme Beardsmore	AUSTRALIA

IASPEI/IAVCEI Commission on Physics & Chemistry of Earth Materials

<i>Chair & IASPEI Representative:</i>	Jiuhua Chen	USA
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IAPSO/IASPEI/IAVCEI Joint Tsunami Commission

<http://research.jisao.washington.edu/tsunamicommission>

<i>Chair & IASPEI Representative:</i>	Vasily V. Titov	USA
<i>Vice-Chairs:</i>	Fumihiko Imamura	JAPAN
	Ahmet Yalciner	TURKEY
<i>Secretary:</i>	Phil Cummins	AUSTRALIA

IASPEI/IAVCEI Working Group on Subduction Zones Located in Developing Countries (SZLDC)

<i>Chair:</i>	Raymond P. Maximo	USA
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IAGA/IASPEI/IAVCEI Working Group on Electromagnetic Studies of Earthquakes & Volcanoes (EMSEV)

www.emsev-iugg.org/emsev

<i>Chair:</i>	Jacques Zlotnicki	FRANCE
<i>Vice-Chair & IASPEI Representative:</i>	Malcolm J.S. Johnston	USA
<i>Secretary:</i>	Toshiyasu Nagao	JAPAN

IASPEI /IAGA International Ocean Network (ION)

<http://msg.whoi.edu/ION/index.html>

<i>Chair:</i>	Yoshiyuki Kaneda	JAPAN
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IASPEI Liaison: Johannes Schweitzer NORWAY

FURTHER GROUP WITH IASPEI COMMISSION STATUS

International Federation of Digital Seismograph Networks (FDSN)

www.fdsn.org

Chair: Sergio Barrientos CHILE
Secretary General Michelle Grobbelaar SOUTH AFRICA

IASPEI REPRESENTATIVES TO IUGG AND OTHER GROUPS

IAU/IUGG Working Group on Non-Rigid Earth Nutations

Representative: Bruce A. Buffett USA

ISC Executive Committee

Representative: IASPEI Secretary-General (Johannes Schweitzer) NORWAY

IUGG Commission on Mathematical Geophysics

Representative: Malcolm Sambridge AUSTRALIA

IUGG GeoRisk Commission

Representative: Mohsen G. Ashtiani IRAN

SCAR (Solid Earth Geophysical Working Group)

Representative: Kanao Masaki JAPAN

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Representative: Thorne Lay USA

IUGG Working Group on History

Representative: Roger Musson UK

IUGG Commission on Climatic and Environmental Changes

Representative: Domenico Giardini SWITZERLAND

IUGG Commission on Planetary Science

Representative: Philippe Lognonné FRANCE

IUGG Commission on Data and Information

Representative: Michelle Guy USA

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 1907-1911 Arthur Schuster (UK)
 1911-1916 Boris Galitzin (Russia)
 1916-1922 Georges Lecointe (Belgium)
 1922-1930 Herbert H. Turner (UK)
 1930-1936 Emilio Oddone (Italy)
 1936-1940 Nicholas H. Heck (USA)
 1940-1951 Robert Stoneley (UK)
 1951-1954 Beno Gutenberg (USA)
 1954-1957 Keith E. Bullen (Australia)
 1957-1960 Harold Jeffreys (UK)
 1960-1963 Perry Byerly (USA)
 1963-1967 John Hodgson (Canada)
 1967-1971 Kiyoo Wadati (Japan)
 1971-1975 Vladimir A. Magnitsky (USSR)
 1975-1979 Hans Berckhemer (F.R. Germany)
 1979-1983 Bruce A. Bolt (USA)
 1983-1987 Ziro Suzuki (Japan)
 1987-1991 Stephan Müller (Switzerland)

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 1922-1942 Edmond Rothé (France)
 1942-1971 Jean P. Rothé (France)
 1971-1979 Jean-Claude de Bremaecker (USA)
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 1991-2003 E. Robert Engdahl (USA)
 2003-2015 Peter Suhadolc (Italy)

1991-1995	Alexei V. Nikolaev (Russia)
1995-1999	Claude Froidevaux (France)
1999-2003	Brian L.N. Kennett (Australia)
2003-2007	E. Robert Engdahl (USA)
2007-2011	Zhongliang Wu (China)
2011-2015	Domenico Giardini (Switzerland)

International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Association Internationale de Volcanologie et de Chimie de l'Intérieur de la Terre (AIVCIT)

www.iavceivolcano.org

At the First General Assembly of IUGG (Rome, 2-10 May 1922), the *Section de Vulcanologie* became one of the constituent sections of the Union. This name was changed into *Association Internationale de Vulcanologie* at the Fourth General Assembly (Stockholm 1930). It took its present name at the Moscow General Assembly (1971).

IAVCEI BUREAU 2015 – 2019

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<i>Webmaster & Membership Secretary:</i>	Eugenio Nicotra	ITALY

IAVCEI COMMISSIONS

CHEMISTRY OF THE EARTH

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<i>Co-Leaders:</i>	Franco Tassi	ITALY
	Santiago Arellano	SWEDEN
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Commission on Volcanic Lakes

<i>Co-Leaders:</i>	Dmitri Rouwet	ITALY
	Bruce Christenson	NEW ZEALAND

Commission on Volcano Geology

<i>Co-Leaders:</i>	Joan Marti	SPAIN
	Gianluca Groppelli	ITALY

Commission on Geochemistry

<i>Leaders:</i>	Ben Andrews	USA
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IASPEI/IAVCEI Joint Commission on Physics and Chemistry of Earth Materials

<i>Co-Chairs:</i>	Ian Jackson	AUSTRALIA
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VOLCANIC PROVINCES AND PROCESSES

Commission on Collapse Calderas

<i>Co-Leaders:</i>	Shanaka de Silva	USA
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Commission on Explosive Volcanism

<i>Co-Leaders:</i>	Daniele Andronico	ITALY
	Mattia de' Michieli Vitturi	ITALY

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	Mike Widdowson	UK
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Commission on Monogenetic Volcanism

<i>Co-Leaders:</i>	Ben van Wyk de Vries	FRANCE
	Marie-Noelle Guilbaud	MEXICO
	Jiaqi Liu	CHINA

Commission on Submarine Volcanism

<i>Co-Leaders:</i>	Rebecca Carey	AUSTRALIA
	Michael Perfit	USA
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Commission on Volcanogenic Sediments

<i>Leader:</i>	Eric Breard	USA
<i>Secretary:</i>	Gabor Kereszturi	NEW ZEALAND

Commission on Volcano Geoheritage and Protected Volcanic Landscapes

<i>Co-Leaders:</i>	Tom Casadevall	USA
	Joan Marti	SPAIN
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MITIGATION OF VOLCANIC DISASTERS

Commission on Volcanic Hazards and Risk

<i>Co-Leaders:</i>	Heather Wright	USA
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Commission on Statistics in Volcanology

<i>Co-Leaders:</i>	Patrick Whelley	USA
	Christina Magill	AUSTRALIA

Commission on Tephra Hazard Modelling

<i>Co-Leaders:</i>	Marco Pistolesi	ITALY
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Commission on Cities and Volcanoes

<i>Leader:</i>	Carolyn Driedger	USA
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World Organization of Volcano Observatories (WOVO)

<i>Co-Chairs:</i>	Gill Jolly	NEW ZEALAND
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The International Volcanic Health Hazard Network (IVHHN)

<i>Leader:</i>	Claire Horwell	UK
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VOLCANO GEOPHYSICS AND REMOTE SENSING

Commission on Remote Sensing

<i>Chair:</i>	Fred Prata	NORWAY
<i>Secretary:</i>	Simon Carn	USA

Commission on Volcano Geodesy

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	Jose Fernandez	SPAIN

IAGA/IASPEI/IAVCEI Working Group on Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV)

www.emsev-iugg.org/emsev

<i>Chair:</i>	Jacques Zlotnicki	FRANCE
<i>Vice-Chair:</i>	Malcolm J.S. Johnston	USA
<i>Secretary:</i>	Toshiyasu Nagao	JAPAN
<i>IAVCEI Liaison:</i>	Takeshi Hashimoto	JAPAN

Working Group on Volcano Acoustics

<i>Leader:</i>	David Fee	USA
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IAVCEI/IAS Commission on Volcano-Ice Interaction

<i>Co-Leaders:</i>	Christopher Hamilton	USA
	Hugo Delgado Granados	MEXICO
	Thor Thordarson	ICELAND

IASPEI/IAVCEI International Heat Flow Commission

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<i>Vice-Chair:</i>	Massimo Verdoya	ITALY
<i>Secretary:</i>	Sukanta Roy	INDIA
<i>Vice-Secretary:</i>	Graeme Beardsmore	AUSTRALIA

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1922-1927	Antoine Lacroix (France)
1927-1933	Alessandro Malladra (Italy)
1933-1936	Constantine A. Ktenas (Greece)
1936-1948	Auguste Michel-Lévy (France)
1948-1954	Berend G. Escher (Netherlands)
1954-1963	Alfred Rittmann (Switzerland/Italy)
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1967-1971	Gordon A. MacDonald (USA)
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2007-2011	Setsuya Nakada (Japan)
2011-2015	Ray Cas (Australia)

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1999-2007	Steve R. McNutt (USA)
2007-2015	Joan Marti (Spain)

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ANNUAIRE 2019 YEARBOOK

The composition of the National Committees and, in consequence, the names of the officially accredited national representatives to the Union and its eight Associations are in conformity with what was communicated to the IUGG Secretariat in 2018.

La composition des Comités Nationaux et par voie de conséquence les noms des représentants nationaux officiellement accrédités auprès de l'Union et de ses huit Associations sont conformes à ce qui a été communiqué au Secrétariat de l'UGGI en 2018.

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Centre de Recherche en Astronomie, Astrophysique et Géophysique (CRAAG)
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Comité Nacional de la Unión Geodésica y Geofísica Internacional
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Web: www.ign.gob.ar

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Austrian Geodetic Commission
Bundesministerium für Digitales und WirtschaftsstandortAbteilung I/11
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Palais des Académies-Paleis der Academiën
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1000 Brussels

Contact: L. HANSEN

Web: <http://bncgg.oma.be>

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Academia Nacional de Ciencias de Bolivia
P.O. Box 11253
La Paz

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BOSNIA & HERZEGOVINA - BOSNIE & HERZEGOVINE

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Union of Associations of Geodetic Professionals in Bosnia and Herzegovina
Stjepana Tomica 1 / III
71000 Sarajevo

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IASPEI:	I. BRLEK	IAVCEI:			

BRAZIL - BRESIL

ADHERING ORGANIZATION

Diretoria de Geociências
Instituto Brasileiro de Geografia e Estatística
Avenida Brasil 15671, Bloco III-B
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Rio de Janeiro, RJ, 21241-051
Web: www.ibge.gov.br

NATIONAL COMMITTEE

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IASPEI:	M. ASSUMPÇÃO	IAVCEI:	R.V. CONCEIÇÃO		

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Bulgarian Academy of Sciences
bul. 15 Noemvri, 1
1040 Sofia

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International Affiliations Program
International Relations Office, Bldg. M-50
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Contact: P.-O. BÉDARD**Web:** http://cgu-ugc.ca/cnc_iugg/**NATIONAL COMMITTEE****President:** R. PETRONE**Chairperson:** G. YOUNG**National Correspondents of the Associations****IACS:** R. KELLY

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G. ALI

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IAG: C. ITURRIAGA Sáez**IAMAS:** G. NAVARRO Schlotterbeck**IAVCEI:** J. A. NARANJO Soza**IAGA:****IAPSO:** P. CARRASCO Hellwig

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China Association for Science and Technology (CAST)
 Institute of Atmospheric Physics (IAP)
 Chinese Academy of Sciences (CAS)
 Bldg. 40 Huayanli, Beichenxilu
 Beijing, 100029

Contact: J. P. LI

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IASPEI:	Z. F. DING	IAVCEI:	Y. G. XU		

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Academia Sinica
 128, Academy Road, Sec. 2
 Taipei, Taiwan

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IAHS:	F. J. CHANG	IAMAS:	P. K. WANG	IAPSO:	C. T. LIU
IASPEI:	K. F. MA	IAVCEI:	S. R. SONG		

COLOMBIA - COLUMBIE**ADHERING ORGANIZATION**

Instituto Geográfico Agustín Codazzi
 Oficina Asesora de Planeación - Cooperación Internacional Carrera 30 No. 48-51
 Bogotá, D.C.

Contact: A. DEL PILAR MORENO HERNÁNDEZ

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Vice-President: A. CARDENAS

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IASPEI:	C.A. VARGAS JIMENEZ	IAVCEI:	M. L. CALVACHE		

D.R. CONGO - R.D. CONGO

ADHERING ORGANIZATION

Centre de Recherche en Geophysique (CRG)
B.P. 10336
Kinshasa I

NATIONAL COMMITTEE

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IAHS: G. GULEMVUGA

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IAMAS: D. KAMUNGA MUSUNGAY

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IAGA:

F.M. MOSHI

IAPSO:

COSTA RICA

ADHERING ORGANIZATION

Academia Nacional de Ciencias
Apartado postal: 1367-2050
San Pedro

Contact: M. PROTTI

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NATIONAL COMMITTEE

President: M. PROTTI

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National Correspondents of the Associations

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IASPEI: M. PROTTI QUESADA

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IAMAS: W. FERNANDEZ

IAVCEI: J. PACHECO

IAGA:

IAPSO: A. GUTIERREZ

CROATIA - CROATIE

ADHERING ORGANIZATION

Croatian Academy of Sciences and Arts
Trg Nikole Subica Zrinskog 11
10000 Zagreb

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President: M. ORLIC
Vice-President: B. PRIBICEVIC

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IAHS:

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IASPEI:

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IAG:

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Please note.

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LIST OF ACRONYMS

AGU	American Geophysical Union
BGI	International Gravimetric Bureau
BIPM	Bureau International des Poids et Mesures
CCEC	Commission on Climatic and Environmental Change
CMG	Commission on Mathematical Geophysics
CODATA	Committee on Data for Science and Technology
COSPAR	Committee on Space Research
EMSEV	IAGA/IASPEI/IAVCEI Inter-Association Working Group on Electromagnetic Studies of Earthquakes and Volcanoes
FAGS	Federation of Astronomical and Geophysical Data Analysis Services
GGOS	Global Geodetic Observing System
GOOS	Global Ocean Observing System
GRC	Commission on Geophysical Risk and Sustainability
IACS	International Association of Cryospheric Sciences
IAG	International Association of Geodesy
IAGA	International Association of Geomagnetism and Agronomy
IAHS	International Association of Hydrological Sciences
IAMAS	International Association of Meteorology and Atmospheric Sciences
IAPSO	International Association for the Physical Sciences of the Ocean
IASPEI	International Association of Seismology and Physics of the Earth's Interior
IAU	International Astronomical Union
IAVCEI	International Association of Volcanology and Chemistry of the Earth's Interior
ICAO	International Civil Aviation Organization
ICET	International Council of Earth Tides
ICSU	International Council for Science
IGES	International Geoid Service
IHP	International Hydrological Programme
ILP	International Lithosphere Program
IOC	International Oceanographic Commission
IO3C	International Ozone Commission
ION	International Ocean Network
IPGH	Instituto Panamericano de Geografia Historia (also PAIGH)
ISC	International Science Council
ISGI	International Service of Geomagnetism Indices
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
PAIGH	PanAmerican Institute of Geography and History
SCAR	Scientific Committee on Antarctic Research
SCL	Scientific Committee on the Lithosphere
SCOR	Scientific Committee on Ocean Research
SCOSTEP	Scientific Committee on Solar-Terrestrial Physics
SEDI	Study of the Deep Interior of the Earth
UCDI	Union Commission on Data and Information
UCPS	Union Commission on Planetary Sciences
UNESCO	United Nations Educational, Scientific and Cultural Organization
URSI	Union Radio Scientifique Internationale
WCRP	World Climate Research Programme
WDC	World Data Center
WDS	ICSU World Data System
WMO	World Meteorological Organization