

IUGS - International Union of Geological Sciences

Activities' Report – Year 2024

Prof. Rodolfo Carosi

1. Introduction

Founded in 1961, the International Union of Geological Sciences (IUGS) is one of the largest and most active scientific NGOs in the world. The IUGS promotes and supports the study of geological problems of global interest and facilitates cooperation and interdisciplinarity in the Geological Sciences. As one of the major Union of the International Science Council, the IUGS has more than 110 member nations and represents more than fifty scientific associations.

2. Main activities carried on by IUGS during 2024 relevant for Italy and for CNR

The activities of the IUGS Commissions are the basis of the daily work of geologists, in Italy and around the world. Nomenclatures, updates of the international geological time scale, classifications, normative parameters, analytical procedures, protocols - so-called geostandards - are studied and established conventionally by the IUGS Commissions. The IUGS is also active in the identification and promotion of emerging themes, such as Medical Geology, and/or with a strong social and civil connotation, e.g. Forensic Geology, and represents a platform of international consensus in geological practices. Also in this case, it is difficult to identify the effects, even if considerable, of the various IUGS activities at the individual nations' level. However, we can consider the foundation of the Association of Medical Geology and the Association of Forensic Geologists as a national fallout of the IUGS activities.

If geologists from all over the world speak a common language and can effectively compare the results of research and professional and industrial activity, it is also thanks to IUGS which, for over half a century, has promoted and encouraged discussion and consensus in the geoscientists community.

The new IUGS commission on the nomenclature of igneous rocks Task Group on Igneous Rocks (TGIR) – chair Prof. M. Lustrino, University of Rome is completing an important review and updating work.

The continuous updates of the international geologic time scale by the International Commission on Stratigraphy are used by all geoscientists every day.

The new International Association of Structural Geology and Tectonics (IASGT website: <https://iasgt.org/>) recognized by IUGS in July 2023 was established, which sees the participation of Rodolfo Carosi and Salvatore Iaccarino (Unito), Eugenio Fazio (Unict) and Lorenzo Gemignani (Unibo) within the Executive Board. In February 2024, an international workshop was organized in Kharagpur (India) with the participation of over 200 students and PhD students and the presentation of 20 keynotes by international experts including Chiara Montomoli (Unito) and Rodolfo Carosi (Unito).

The ten geological heritage sites within the international initiative of IUGS: The Second 100 IUGS GEOLOGICAL HERITAGE SITES. The 100 geosites were selected through peer review (including several Italian geoscientists) and were presented at the 37th ICG Congress in Busan, Korea 2024 and published in a book (both pdf and paper). Among the new second 100 geological heritage sites there are seven sites on Italian territory. A specific article was published in the journal 'Geologicamente' of the Italian Geological Society by Rodolfo Carosi and Grazia Signori (Ateneo di Scienze, Lettere e Arti di Bergamo) (<https://www.geologicamente.it/files/download/numeri/geologicamente15.pdf>).

The seven new Italian sites approved are: Arduino's lithostratigraphical sequence of the Agno Valley and Vesuvius volcano for the category History of geosciences; Latemar Triassic carbonate platform and Pliocene cyclostratigraphy of Scala dei Turchi for the Stratigraphy and sedimentology category; The Mohorovicic discontinuity in the Ivrea- Verbano Zone and The ultrahigh-pressure unit of the Dora-Maira Massif for the Igneous and Metamorphic petrology category; Surface faulting of a seismic sequence in Mt. Vettore for the Tectonics category (<https://iugs-geoheritage.org/>).

The collection of the first 55 World Heritage Stones was also presented, which includes four Italian Heritage Stones (<https://iugs-geoheritage.org/publications-dl/IUGS-FIRST-55-STONES-WEB-BOOK.pdf>).

For GeoCollections, there is the Valdarno Pliocene and Pleistocene mammals collection hosted at the Natural History Museum of the University of Florence (website: <https://iugs-geoheritage.org/geo-collections/valdarno-plioceneand-pleistocene-mammals/>).

3. Activities carried on by the Delegate within the Union during 2024 and impact on the Italian scientific community

As the Italian delegate at the IUGS -with the help of the secretariat of the CNR-IUGS Commission- I promptly disseminated all communications from the Executive Committee and the Secretariat within the commission itself and within the national scientific community through the mailing lists and newsletters of the Italian Geological Society, the largest and oldest Italian scientific society in the field of Geosciences, which reaches several thousand geologists and Earth scientists. Of particular note is the attention given to Italian participation in the proposal and revision of the geoheritage sites, geoheritage stones and in the Geocollections.

4. Evaluation of the participation in terms of benefits and membership cost

As already highlighted several times in the past, it is very difficult to fully evaluate the direct benefits of participation in IUGS. The activity of IUGS is fundamental and irreplaceable for researchers in the various disciplines of Earth Sciences, geological services, analysis laboratories, and professionals and even for students of geological disciplines. From this point of view, the support of the CNR, as well as of the various Academies, Geological Services, Ministries, and research institutions of the over one hundred countries adhering to IUGS, must be seen and interpreted as support for a basic and widespread international activity, essential for the entire global system of research in the sector of Earth Sciences. Such support is even more important in a time of international difficulty in finding raw materials and of growing attention to the environment and climate change and the effects on the territory and populations. It is worth noting the limited involvement of the CNR-IUGS Commission by IUGS, concentrated essentially in the years in which the world geological congress is held.

5. Evaluation of Italians' attendance and how to improve interest and involvement

The Italian community has always been significantly involved in the various activities of the IUGS, both at an organizational and scientific level. As regards the Italian participation in the international scientific cooperation program IGCP (IUGS-UNESCO) we recall that Laura Peruzza (OGS, Trieste) has an active project IGCP_IUGS-IGCP 669: Identification of seismogenic faults in populated areas of Latin America and its incorporation into seismic hazard assessment. The projects HERitage STONES Recognition (HerSTONES) IGCP project 637 (Resp. Paola Mariani, Polito) and the IGCP 714 Project "3GEO – Geoclimbing & Geotrekking in Geoparks" (Resp. Irene Bolatti, Unimi) are also active.

6. Italian experts with important roles within the Union or within related Commissions and Programs (if known)

Italian representatives are part of the main management bodies of IUGS, namely the Bureau and the Executive Committee, and chair or participate in the activities of various IUGS Committees and Commissions. Italy currently has two representatives in the Executive Committee, composed of ten members. Together with Germany, it is the only country with two representatives. As regards the international scientific cooperation programme IGCP (IUGS/UNESCO), one project is currently led by an Italian researcher (see point 5). Below is the list of Italian representatives.

PETRIZZO Maria Rosa, Vice President of IUGS (2024-2028) and Chair, Cretaceous Subcommittee of the IUGS International Commission on Stratigraphy
ERBA Elisabetta, chair della International Commission on Stratigraphy
DI MAGGIO Rosa Maria, Officer for Europe, Initiative on Forensic Geology
DI CAPUA Giuseppe, Website of IUGS
RAFFI Isabella, Chair Neogene Subcommittee of the IUGS International Commission on Stratigraphy
RICCI Alberto Carlo, Rappresentante IUGS presso SCAR (Scientific Committee on Antarctic Research)
MONECHI Simonetta, Chair Paleogene Subcommittee of the IUGS International Commission on Stratigraphy
VACCARI Ezio, Vice-President, IUGS Commission on the History of Geological Sciences
VILLA M. Igor, Chair IUGS Task Group on Isotope Geology and Geochronology
LUSTRINO Michele, Chair del nuovo Task Group to integrate and revise the classification and nomenclature of igneous rocks

Italy was one of the countries with the highest participation in IUGS initiatives both in terms of number of researchers and presence in top roles in various bodies (45 people, listed below).

ADANEZ Paula, Scientific Secretary, Commission on Global Geochemical Baselines
AGNINI Claudia, Padova, Secretary/Voting Member, ICS Subcommittee on Paleogene Stratigraphy
ANGIOLINI Lucia, Milano, Chair, ICS Subcommittee on Permian Stratigraphy
BAGNOLI Gabriella, Pisa, Voting Member, ICS Subcommittee on Cambrian Stratigraphy
BALINI Marco, Milano, Voting Member, ICS Subcommittee on Triassic Stratigraphy
BARONE Pier Matteo, Rome, Crime Scene Advisor, Initiative on Forensic Geology
CAROSI Rodolfo, Torino, Member and Past Chair, Commission on Tectonics and Structural Geology and actually member of the EB of the IASGT
COCCIONI Rodolfo, Chair, Rupelian/Chattian Boundary Stratotype Working Group, ICS Subcommittee on Paleogene Stratigraphy; Member, the Campanian Working Group, ICS Subcommittee on Cretaceous Stratigraphy; Member, the Aptian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
CORRADINI Carlo, Trieste, Webmaster/Voting Member and D-C Boundary Working Group Member, ICS Subcommittee on Devonian Stratigraphy; Vice 17 President, ICS Subcommittee on Silurian Stratigraphy
CRAIG Jonathan, Milan, IGCP council member - Earth Resources
DI CAPUA Giuseppe, Webmaster, IUGS Publications Committee
DI MAGGIO Rosa Maria, Rome, Officer Europe, Initiative on Forensic Geology
DINARÈS-TURELL Jaume, Rome, Voting Member, ICS Subcommittee on Paleogene Stratigraphy
DOMINICI Stefano, Firenze, Webmaster, ICS Subcommittee on Paleogene Stratigraphy
ERBA Elisabetta, Milano, Chair, the Aptian Working Group, ICS Subcommittee on Cretaceous Stratigraphy; Member, the Barremian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
FALZONI Francesca, Napoli, Secretary General, ICS Subcommittee on Cretaceous Stratigraphy
FORESI L. M., Member, Working Group on Langhian and Burdigalian GSSPs, ICS Subcommittee on Neogene Stratigraphy
GIANOLLA Piero, Ferrara, Voting Member, ICS Subcommittee on Stratigraphic Classification
MUTTONI Giovanni, Milano, Member, the Campanian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
IACCARINO Silvia. M., Member, Working Group on Langhian and Burdigalian GSSPs, ICS Subcommittee on Neogene Stratigraphy
IACCARINO Salvatore, member of the EB of the IASGT
PRIMOLI SILVA Isabella, Milano, Member, the Campanian Working Group; Member, the Barremian Working Group; Member, the Valanginian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
LIRER Fabrizio, Napoli, Voting Member, ICS Subcommittee on Quaternary Stratigraphy; Voting Member, ICS Subcommittee on Neogene Stratigraphy
LUSTRINO Michele, Rome, Chair, Task Group on Igneous Rocks
MARIANO Parente, Napoli, Member, the Aptian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
MARINI Paola, Turin, Leader IGCP 637 - Heritage Stone Designation
MARIO Sprovieri, Member, the Campanian Working Group, ICS Subcommittee on Cretaceous Stratigraphy
MATTEO Maron, Milano, Member, the Campanian Working Group, ICS Subcommittee on Cretaceous

Stratigraphy

MIETTO Paolo, Padova, Voting Member, ICS Subcommittee on Triassic Stratigraphy

MONETTI Simonetta, Chair, Paleogene Calcareous Nannofossils Working Group, ICS Subcommittee on Paleogene Stratigraphy

NICORA Alda, Milano, Voting Member, ICS Subcommittee on Triassic Stratigraphy

OCCHIPINTI Susanna, Sub commissions Commission on Geoscience Education (COGE), Responsible of the GEFO Program.

PAPAZZONI Cesare, Chair, Paleogene Larger Foraminifera Working Group, ICS Subcommittee on Paleogene Stratigraphy

PEPPOLONI Silvia, Rome, president of the IAPG e chair della Commission on Geoethics

PETRIZZO Maria Rose, Milano, Chair, ICS Subcommittee on Cretaceous Stratigraphy; Member, the Campanian Working Group of SCS/Voting Member, 18 ICS Subcommittee on Stratigraphic Classification

RAFFI Isabella, Chieti Scalo, Voting Member, ICS Subcommittee on Stratigraphic Classification; Voting Member, ICS Subcommittee on Neogene Stratigraphy

RONCHI Ausonio, Pavia, Voting Member, ICS Subcommittee on Permian Stratigraphy

ROOK Lorenzo, Pavia, Officer, ICS Subcommittee on Neogene Stratigraphy

SABRINA Amodio, Napoli, Member, the Aptian Working Group, ICS Subcommittee on Cretaceous Stratigraphy

SOLDATI Mauro, Governing Council, Deep-time Digital Earth Big Science Program

SPALLETTA Claudia, Bologna, Member D-C Boundary Working Group Member; Voting Member, ICS Subcommittee on Devonian Stratigraphy

STEFANO A. Di, Member, Working Group on Langhian and Burdigalian GSSPs, ICS Subcommittee on Neogene Stratigraphy

TIBALDI A., Chairperson – Committee of National Representatives, International Lithosphere program

TURCO Elena, Parma, Vice Chair, ICS Subcommittee on Neogene Stratigraphy

VACCARI Ezio, Varese, President, International Commission on History of Geological Sciences

7. If Union with CNR Commission, short summary about the 2024 CNR Commission activities

The CNR-IUGS Commission was reconstituted with Provision of the CNR President n.118 (prot. 284122/2023 of 28/09/2023) having completed its mandate on 31 December 2022. The members of the Commission are: Dr. Daniela Di Bucci, Prof. Carlo Doglioni, Dr. Massimo Frezzotti, Dr. Biagio Giaccio, Prof. Simonetta Monechi, Prof. Isabella Raffi, Dr. Guido Ventura, Dr. Marco Amanti, Prof. Carlo Baroni, Dr. Giacomo Corti, Dr. Antonello Provenzale, Prof. William Cavazza and Prof. Silvia Peppoloni IUGS Liaison. Commission Secretary: Dr. Cecilia Lalle.

The Italian National Commission of the IUGS has published in electronic format an annual report on the International Geoscience Programme (IGCP), which is distributed to the entire scientific community of Earth Sciences through the Italian Geological Society. The report reaches more than 2,000 geoscientists.

The CNR-IUGS Commission met on July 18, 2024 in telematic mode with the following agenda: 1. Communications from the titular Representative for the CNR in IUGS; 2. Update on the IGC of Busan and the Italian Delegation; 3. Applications for the position of IUGS President; 4. Miscellaneous.

The minutes of the meeting were published on the CNR web page relating to the Union:

<https://www.cnr.it/it/organismo-scientifico-internazionale/39/iugs-international-union-of-geological-sciences>

The Commission also had the task of providing directions and proposals for greater Italian participation in the Union's activities and providing the necessary support to the CNR on issues concerning international initiatives and activities promoted by IUGS. Among the activities carried out by the Commission in 2024, the following are highlighted:

- Endorsement for the candidacy of Prof. Silvia Peppoloni as IUGS President for the period 2024-2028;
- Dissemination of the IUGS Annual Report 2024 within the Commission, the CNR and the Italian community;

- Dissemination of news of interest to the national IUGS community published in the IUGS Newsletters in 2024;
- Sending of the Italian CNR-IUGS-IGCP 2024 Report to IUGS and publication of the same on the CNR website on the relevant page;
- Identification of the Italian delegation to the 37th ICG in Busan, composed of 4 Members.

Cecilia LALLE (CNR-International Relations Unit), also regularly informed the members of the National CNR IUGS Commission regarding the publication of the newsletters, summarizing the contents of greatest interest.

CNR-IUGS Commission does not directly organize activities for the dissemination of scientific culture. However, some members of the Commission participated, as usual, in the organization of the 2024 edition of the "Earth Week" (October 2024), a series of numerous events aimed at promoting awareness of geological issues among the general public, developed simultaneously throughout the country. The latest edition of the Week, which has acquired an annual cadence, included dozens of events and the participation of thousands of people. Michele Lustrino (La Sapienza University of Rome) is Chair of the TASK GROUP on igneous rocks approved at the end of 2020 by IUGS. The group aims to update the IUGS classification of magmatic rocks almost 20 years after the release of the second edition of the international reference text.

The work of the group, composed of an international representation of petrographers and geochemists, has already begun and intends to intervene on the existing classification and nomenclature by proposing a new taxonomy. It should be noted that Prof. Elisabetta Erba (UniMi) was recently elected chair of the International Commission on Stratigraphy with an appointment at the 37th ICG Busan 2024. At the same congress, Prof. Maria Rose Petrizzo was elected Vice President of IUGS.

As part of the major IUGS event, the 37th International Geological Congress held in Busan (Korea) from 23 to 31 August 2024, two Italians were members of the International Scientific Committee: Alessandro Mari Michetti (Univ. Dell'Insubria) and Adele Bertini (Univ. Di Firenze).

Italy at the 37th IGC in Busan was officially represented by a delegation composed of four professors representing the national geological community: Elisabetta Erba (University of Milan), Simonetta Monechi (University of Florence), Michele Zucali (University of Milan) and Rodolfo Carosi (University of Turin) as head of the delegation. The delegation participated, in addition to the scientific sessions, in the interesting Plenaries (including the Plenary speech by Silvia Peppoloni entitled "On the future of geosciences through the lens of geoethics") and in the two days of intense work of IUGS on 28 and 29 August.

During the two days, the activities of the various commissions, subcommissions, task groups of the IUGS were examined, and the votes were held for the next IGC of 2028 (to be held in Canada) as well as the approval of the second 100 Geological Heritage Sites and the first 55 Heritage Stones with some all-Italian successes. A public report of the activities carried out by the delegation was published in the November 2024 issue 15 of the SGI magazine, *Geologicamente* (<https://www.geologicamente.it/files/download/numeri/geologicamente15.pdf>).

At the international congress in Busan, there were numerous sessions with Italian conveners or co-conveners:

Sessione T1 Sedimentary Geology S4: Convener: Andrea Di CAPUA (CNR - IGAG) Co-Convener: Federica Barilaro (CNR - IGAG), Gianluca GropPELLI (CNR - IGAG), Gi Bom KIM (Pusan National University), Gianluca Norini (CNR - IGAG), Young Kwan Sohn(Gteongsang National University), Roberto Sulpizio(University of Bari)

Session T7 Volcanology S3: Convener: Gianluca GROPELLI (National Research Council. Institute of Environmental Geology and Geoengineering) Co-Convener: Joan Marti Molist (Geosciences Barcelona, CSIC)

Session T9 Structural Geology S4: Convener: Young-Seog KIM (Pukyong National University) Co-Convener: Anita Torabi (University of Oslo), Fabrizio Agosta (University of Basilicata)

Session T9 Structural Geology S7: Convener: Rodolfo Carosi (University of Turin) Co-Convener: Montomoli Chiara (University of Turin), Jain Arvind Kumar (Indian Institute of Technology), Paudyal Kabiraj (Tribhuvan University)

Session T9 Structural Geology S8: Convener : Rodolfo Carosi(University of Turin) Co-Convener: Mamtani A. M.(Indian Institute of Technology), Montomoli C.(University of Turin), Iaccarino S.(University of Turin)

Session T22 GIS and Remote Sensing S2: Convener: Kristine ASCH (Federal Institute for Geosciences and Natural Resources (BGR)) Co-Convener: Marco Pantaloni (Italian Institute for Environmental Protection and Research (ISPRA))

Session T26 Geoscience Education S8: Convener: Sandra VILLACORTA (IUGS Commission on Geoscience Education) Co-Convener: Susanna Occhipinti, Ian Clark, Young-Shin Park

Session T27 Geoheritage, Geopark and Geotourism S2: Convener: Gurmeet KAUR (Panjab University) Co-Convener: Paola Marini (Poitecnico di Torino), Raymond Duraiswami (Savitri Bai Phule University)

Session T27 Geoheritage, Geopark and Geotourism S3: Convener: Ezio VACCARI (INHIGEO / Università degli Studi dell'Insubria) Co-Convener: Martina KÖLBL-EBERT (INHIGEO / Ludwig-Maximilians Universität München)

Session T31 Geohazards S1: Convener: Paolo BONCIO / D'Annunzio University Co-Convener: Stéphane Baize (IRSN—Institut de Radioprotection et de Sûreté Nucléaire, Fontenay-aux-Roses, France) Yann Klinger (Université de Paris Cité, Institut de Physique du Globe de Paris, CNRS, Paris, France) Oona Scotti (IRSN—Institut de Radioprotection et de Sûreté Nucléaire, Fontenay-aux-Roses, France)

Session T38 Anthropocene S2: Convener: Michael WAGREICH (University of Vienna) Co-convener: Maria Rose Petrizzo (University of Milan)

Session T39 Geoethics S1: Silvia PEPPOLONI / National Institute of Geophysics and Volcanology (Rome, Italy)/International Association for Promoting Geoethics (IAPG)

Session T40 History of Geological Sciences S2: Convener: Ezio VACCARI / IUGS INHIGEO President / Department of Theoretical and Applied Sciences, University of Insubria, Italy Co-Conveners: Carol BACON / IUGS INHIGEO Vice-President for Australasia/Oceania Toshihiro YAMADA / IUGS INHIGEO Vice-President for Asia

Session T40 History of Geological Sciences S3: Convener: Martina KOLBL-EBERT / IUGS INHIGEO Secretary-General / Department of Earth and Environmental Sciences, University of Munich, Germany Co-Convener: Ezio VACCARI / IUGS INHIGEO President / Department of Theoretical and Applied Sciences, University of Insubria, Italy.

8. Conclusions

The activity of the CNR-IUGS Commission is essential to make the numerous activities and initiatives of IUGS known more widely in our country at an international level. The dissemination, knowledge and participation in international initiatives is increasingly important in the field of Geology and allows for better valorization of the Earth Sciences community at an international level. The Italian geological community is among the most active in the IUGS field on various fronts and various topics, as demonstrated by the election of Prof. Maria Rose PETRIZZO as Vice President of IUGS, by the election of Prof. E. Erba as chair of the International Commission of Stratigraphy. It is recalled that Silvia Peppoloni is chair of the Geoethics Commission and Ezio Vaccari is chair of the History of Geological Sciences Commission and several Italian geologists are members of the executive board in the International Association of Structural Geology and Tectonics active since February 2024 and recognized and funded by IUGS. It is also worth highlighting the Italian leadership of the new TASK GROUP – IUGS on the revision of the nomenclature of magmatic rocks (M. Lustrino, University of Rome).

In the context of the dissemination of knowledge, some Italian researchers -belonging to the TecTask first and then to the IASG (Rodolfo Carosi and Salvatore Iaccarino, University of Turin)- have started some time ago and are taking care of the publication of seminars on Tectonics and Structural Geology on a dedicated YouTube channel and the revision and updating of the Outcropedia platform. This is dedicated to the knowledge of the best outcrops of rocks of notable interest, through the geolocalization of images on a digital topographic basis. A specific APP has recently been developed for the direct uploading of geoimages directly from a tablet or mobile phone.

Furthermore, the close collaboration with the Italian Geological Society - the oldest and largest Italian society in the field of Geosciences - is fundamental for disseminating information to the vast geological community present in Italy. Recently, the magazine 'Geologicamente' (edited by SGI) hosted articles and news on the activity of the CNR-IUGS Commission, a magazine that reaches over 10,000 people.

Italy is one of the countries with the greatest participation in the IUGS initiatives both in terms of number of researchers and presence in the top roles of various bodies.

Torino, May 25th, 2025

Prof. Rodolfo Carosi

A rectangular box with a light gray background and a thin black border, used to redact the signature of Prof. Rodolfo Carosi. A small handwritten mark is visible to the left of the box.