



Bulliana hot spring (Latium, Italy). Photographer: Orlando Vaselli.

GEOCHEM NEWSLETTER

September 2024, n.17

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Letter from the President

Orlando Vaselli

Dear Friends and Colleagues,

In the second issue of 2024 of our GeochemNewsletter for 2024 we had several contributions by the SoGel members. First of all, as you know, I would like to highlight the success of the 2nd Congress of the Italian Geochemical Society that was held in Perugia at the Monumental Complex of St. Peter, a Benedictine Abbey of the 10th century. Currently, the Monumental Complex is managed by the Foundation for Agricultural Education that houses the facilities of the Department of Agricultural, Food and Environmental Sciences of the University of Perugia. I would like to thank all those people who spent a lot of efforts in organizing this event. More than 100 people attended the congress and 89 were the contributions we received for oral and poster presentations. The abstracts by the 4 plenary speakers: Andrea Bravo (CSIC-Spain), Martina De Sanctis (INAF-Italy), Tobias Fisher (University New Mexico, USA) and Donato Giovannelli (University of Naples, Italy), those of the invited speakers: Giulio A. Ottonello (University of Genoa), Mauro Masiol (University of Venice), Sergio Calabrese (University of Palermo), and Valentina Galluzzi (INAF), who opened the four topics into which the congress was divided (Experimental and Computational Geochemistry; Environmental Geochemistry; Geochemistry of volcanic, geothermal and seismically active areas and Cosmochemistry and Planetary Sciences, respectively) and those submitted by the participants have been published by INGV in the *Miscellanea* n. 81 (<https://editoria.ingv.it/miscellanea/2024/miscellanea81/>) and edited by Alessandra Ariano, Lisa Ricci, Mauro Tieri and Monia Procesi. INGV is gratefully acknowledged for sponsoring the congress and for providing part of the gadgets that were distributed to the attendees. Francesca di Laura (INGV) provided all the logos used during the

congress and the cover graphic design. I would like to personally thank the President of INGV, Carlo Doglioni, and the Director of the National Council of Research – Institute of Geosciences and Earth Resources (CNR-IGG), Antonello Provenzale, for supporting this congress.

Let me also say thanks to Carlo Cardellini and Francesco Frondini who were the local pulsing engine of the congress. The members of the organizing and scientific committees: Alessandra Ariano (UNIPG); Carlo Cardellini (UNIPG); Enrico Dinelli (UNIBO); Cinzia Federico (INGV); Francesco Frondini (UNIPG); Luigi Marini (STEAM Ltd.); Barbara Nisi (CNR-IGG); Elena Pavoni (UNITS); Monia Procesi (INGV); Lisa Ricci (UNIPG); Giuseppe Saldi (UNIPG); Mauro Tieri (UNIPG); Daniela Varrica (UNIPA); Orlando Vaselli (UNIFI); Stefania Venturi (UNIFI); Martina Zucchi (UNIBA); Azzurra Zucchini (UNIPG) and Marino Vetuschi Zuccolini (UNIGE) are also gratefully acknowledged. The convenors: Devis Di Tommaso, Caterina Gozzi and Mattia La Fortezza (Experimental and Computational Geochemistry); Maurizio Barbieri, Elisabetta Dore and Nicolas Greggio (Environmental Geochemistry); Alessandra Correale, Anna Gioncada and Andrea Ricci (Geochemistry of volcanic, geothermal and seismically active areas) and Nadia Balucani, Martina Casalini and Maximiliano Fastelli (Cosmochemistry and Planetary Sciences) masterfully managed the presentations of the 4 topics. The last but not the least, the Municipality and the Province of Perugia and the Umbria Region supported the congress while Encotech, Pollution and Thermo Fischer were our private sponsors. The congress was also the occasion to deliver the SoGel awards: Simone Paternostro and Chris Ogunyele Abimbola shared the Galli Award; Lisa Ricci was awarded with the Panichi Award, Giulio Bini with the Tonani Award

and Stefano Natali had the Tongiorgi Award. I do take this opportunity to thank the 4 commissions who went through the PhD thesis submitted to the Italian Geochemical Society. In the newsletter a short report on the 2nd Congress of the Society by the Perugia's colleagues. The last news from the congress is that, thanks to Maurizio Barbieri, for the first time an international peer-review journal (Environmental Geochemistry and Health), will edit a Special Issue (<https://link.springer.com/collectio ns/cggdjfhjb>) for those researchers who wish to submit a paper, presented as oral or poster to the Perugia's Congress, on Environmental Geochemistry. The editors of the Special Issue are Maurizio Barbieri, Elisabetta Dore and Nicolas Greggio. The deadline to submit the manuscripts is the 31st of December, 2024. I am really proud of this initiative, being the first time, to the best of my knowledge, that a Special Issue will come out labeled with the Italian Geochemical Society.

A few months before (May 21-24), the International Astrobiology School 2024 -10th AbGradE Anniversary was held at Museo degli Innocenti di Florence. The event was sponsored by our Society and Christian Lorenz summarized for the newsletter the salient points of this very successful school. A few days ago another important event was sponsored by the Society: the Granulite & Granulite Conference that was held in Verbania from the 3rd to the 6th of September, 2024. Antonio Langone, who will refer about this conference in the next newsletter, was one of the organizer. Monia Procesi contributed to this newsletter by presenting the main aims of the INGV project titled: THE INGV EMOTION PROJECT - Enhancing understanding of central-northern Italy's low-medium geothermal systems and facilitating access to scientific data.



The project includes several INGV, CNR and university researchers, PhD and post-doc students. Maurizio Ambrosino's (Sannio University) contribution is aimed at developing "a soil passport" by differentiating areas with distinct geochemical signatures (geochemical domains) and estimating their natural background levels.

Unfortunately, we have two obituaries. The first one is dedicated to Filippo Vurro thanks to Anna Garavelli who reminds us how Filippo contributed with his work to mineralogy and geochemistry. I do remember Filippo when on the top of the Island of Vulcano he was collecting fumarolic minerals and sublimates. Maria Bianca Cita recently passed away. I asked Elisabetta Erba and

Rodolfo Carosi to use the obituary they wrote for the Italian Geological Society because with the discover of the desiccation of the Mediterranean Sea Maria Bianca gave a strong input to the geochemistry investigations of the related sediments thanks to projects that included Italian and foreign geochemists.

I do conclude this letter with two special acknowledgements. The first one is to Stefania Venturi for handling again this newsletter issue. The second one is to Jacopo Cabassi for assembling the list of publication of our 188 members. The present list includes 119 articles and refers to the period May 8 – September 4, 2024. Jacopo is using the Comprehensive, multidisciplinary, trusted abstract and citation database of Scopus.

Unfortunately, Scopus has some delays between the publication of a paper and the appearance in this database. This means that the here-reported list could not be complete but not worry, it will be appearing in the text issue of the newsletter.

I do thanks those who contributed to maintain our social alive and more contributions are expected. Inputs by the young researchers in submitting a couple of pages to this newsletters about their scientific activity or relevant field works or excursions would be very appreciated.

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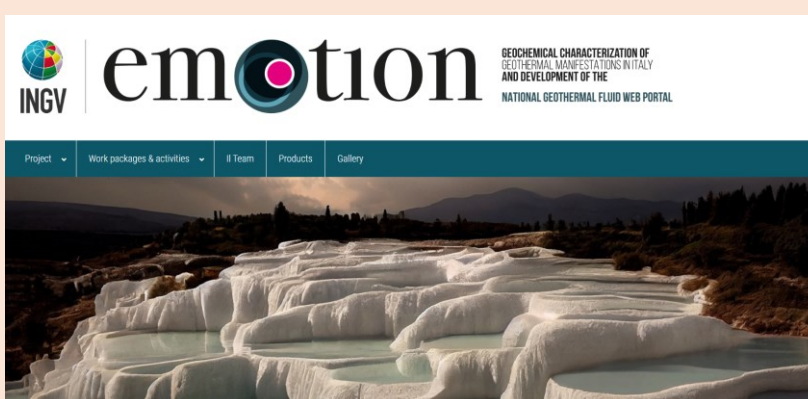
Members' Activities

SCIENTIFIC RESEARCH TO ADVANCE GEOTHERMAL EXPLORATION: THE INGV EMOTION PROJECT - Enhancing understanding of central-northern Italy's low-medium geothermal systems and facilitating access to scientific data

Monia Procesi

The rise in worldwide energy consumption has emphasised the significance of promptly formulating plans to promote low-carbon resources and technology. Given the circumstances, the rise in the use of renewable energies becomes essential. Among the promising options, the development of geothermal energy emerges as a crucial goal, despite, having historically played a limited role in global energy scenarios. This concept becomes particularly relevant for countries characterized by high geothermal potential like Italy, where today, unfortunately, there is limited use of the existing geothermal resources not only in the electricity production but also in thermal applications.

Italy has a significant inclination towards geothermal energy, but exploration studies have mainly concentrated on the period between the 1960s and 1990s. The focus was on the central-southern regions of the country, where the most remarkable geothermal manifestations (thermal springs, fumaroles, gas vents, bubbling pools) are present and where the exploration goals of that time were potentially found. In the meantime, geothermal technology has advanced throughout, enabling the extraction of energy from systems with temperatures slightly above 100°C.



This has also contributed to the growth of direct thermal uses in the industry. This leads to increased attention also towards low-medium temperature resources, potentially located in the central-northern regions of Italy. A change in mindset in energy production, realising the value of decentralisation in favour of small local producers, also shapes this changing focus.

In order to promote the utilisation of geothermal resources and the wider adoption of geothermal energy, it is crucial to identify the resources and characterise the geological systems. In this framework, the geochemical characterisation of surface geothermal manifestations, plays a crucial role in this context. These phenomena are the outermost expressions of the Earth's internal heat, therefore, they are

crucial elements that need to be examined in order to characterise geothermal systems and evaluate the energy potential of the resources.

Finding scientific data, and in particular the geochemical ones, is frequently a challenging endeavour due to the extensive fragmentation of sources. This fragmentation hinders research and exploration activities, leading to a substantial waste of human and economic resources. All of this becomes even more true if the goal is to achieve public access and simplification that shares the principles of **FAIR Data**, so making data Findable - Accessible - Interoperable - Reusable.



This is the process of establishing a uniform set of metadata to facilitate the retrieval of data, securely storing the data in repositories, assuring compatibility between different systems, and providing access to interpretation tools. It should be noted that the term "accessible" does not necessarily mean the same thing as "open." There are instances where FAIR data may be locked due to security concerns or intellectual property rights. The European Commission uses the "open as possible and closed as necessary" policy since some data cannot be made accessible. Apart from these exceptions, all projects sponsored by the European Commission - and more lately by other organisations as well - must make the data supporting study outcomes freely available.

Inspiring by these concerns, the EMOTION Project – "Geochemical characterization of geothermal manifestations in Italy and development of the national geothermal fluid web portal" – has been developed (<https://progetti.ingv.it/en/emotion>).

The three-year EMOTION Project (2023-2025) is led by INGV (Dr. Monia Procesi - INGV Section of Rome1) and funded by INGV's ten-year research program, "Pianeta Dinamico".

Two main objectives of EMOTION are:

1. Enhance the scientific knowledge of low, medium, and high-temperature geothermal systems in central-northern Italy by conducting a thorough geochemical analysis of the geothermal manifestations present in these regions.
2. Create a nationwide public web portal gathering all geochemical data from geothermal manifestations generated both inside the EMOTION project and in past studies and projects including southern parts of the nation.

The project's specific tasks include the following:

- Examining the scientific geochemical literature to determine what data is already accessible.
- Integration of all missing data

through new sampling and analysis to produce an extensive and thorough dataset intended to explore the origins of fluids, the water-gas-rock interaction processes, the estimation of fluid temperatures at depth, and the development of specific conceptual circulation models anchored to solid geological-structural models.

As a result, the public National web portal will compile all the data gathered with EMOTION in a way that facilitates easy access to the information and the creation of online binary and ternary geochemical graphs that enable quick preliminary information to be obtained and subsequently direct more focused research.

Three INGV sections (Roma1-Bologna-Palermo), five university departments (University of Florence- DIST, University of Perugia- DIFG, University of Calabria- DIBEST, University of Genoa- DISTAV, and University of Urbino-DISPeA) and two research institutes (CNR-IGG, INAF) are involved

in EMOTION. Beyond being a research initiative, EMOTION is also an important platform for training and scientific collaboration, enabling the participation of graduates and funding research grants and PhD. This Project does not claim to fully satisfy the need for knowledge about Italian geothermal systems, but it will provide a valuable contribution that can aid geothermal research in Italy. Simultaneously, it can also benefit other fields, including environmental studies, seismology research, the extraction of strategic raw materials, and many other Earth science-related fields.

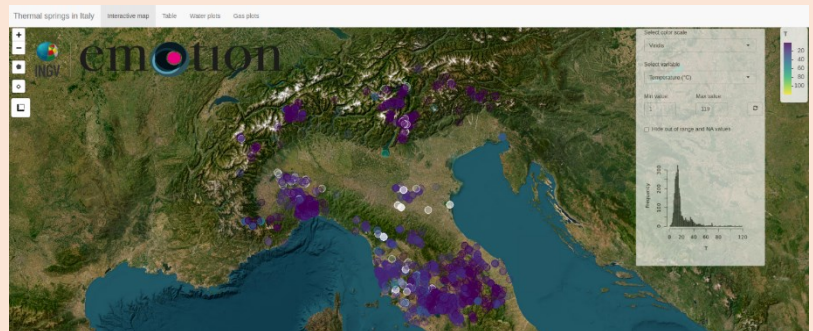
<https://www.youtube.com/watch?v=xFCvrgtusWo>



Ancient fountain at Comano Terme (Trento Province, Northern Italy)



Ferruginous spring (Friuli Venezia Giulia, Northern Italy)



Screenshot of EMOTION web portal – Demo version



International School of Astrobiology (May 2024)

Christian Lorenz

Tuscany, and more precisely Florence, is once again the protagonist of scientific research on a global level. This time, in particular, in relation to the science of Astrobiology. Astrobiology Graduates in Europe (AbGradE), the association of young astrobiology researchers in Europe, and the Arcetri Astrobiology Laboratory (INAF – Arcetri Astrophysical Observatory) have joined forces to organize and announce the first edition of the International Astrobiology School - From interstellar molecules to first cells which was held in Florence at the Museo degli Innocenti from the 21st to 24th of May, 2024, to celebrate the 10th anniversary of the birth of AbGradE. The school was organized by Prof. John Robert Brucato (INAF-OAA), Dr. Andrew Alberini (University of Florence, INAF-OAA), Dr. Christian Lorenz (University of Naples Federico II, INAF-OAA) and Dr. Silvana Pinna (President of AbGradE).

The first International School of Astrobiology ended on the 24th of May 2024 in the Sala Poccetti of the Museo degli Innocenti (Florence). There was a notable turnout, with seats completely sold out, with participants coming from more than 25 different countries, including Japan, South Korea, Brazil, Mexico and the United States, representing all continents except Oceania.

Astrobiology is an interdisciplinary science that arises from the combination of knowledge and skills from research areas relating to astrophysics, biology, chemistry and geology. The objective of this science is to answer two of the most philosophical questions in the history of Man: where do we come from? Are we alone in the Universe? Scientifically

speaking, it deals with studying the origin, evolution and distribution of life forms in the universe, trying to discover their existence outside planet Earth.

Therefore, the training of new generations of researchers with a solid multidisciplinary preparation is more urgent than ever in view of a future full of space exploration projects and missions by the main agencies, including NASA and ESA, to try to respond to the numerous questions of this vast scientific field.

The goal of the School was to offer a unique opportunity for university students, PhD and post-docs from all over the world. The latter participated in a series of seminars focused on the salient themes of astrobiology. Participants had the opportunity to interact with some of the most relevant Italian and international personalities in this field such as John Robert Brucato (INAF-OAA), Paola Caselli (Max Planck – Institute of Extraterrestrial Physics), Jean Pierre de Vera (DLR - German Aerospace Center), Teresa Fornaro (INAF-OAA), Wolf Geppert (Stockholm University), Donato Giovannelli (University of Naples Federico II) Mitchell Schulte (NASA – Ames Research Center) and Cyprien Verseux (ZARM – University of Bremen). Speakers could share the results of their research with the aim of providing the tools necessary to face the future challenges of this research field. Furthermore, participants will be able to interact informally with the speakers through afternoon workshops such as the World Café format: an effective and dynamic method of sharing ideas and strengthening the concept of scientific community.

The spark that led us to create this event is from the awareness that Astrobiology, being a relatively young and continually growing science, requires more than ever a training and development path for young researchers who intend to undertake this path. If we observe the international scientific panorama, space missions from an astrobiological perspective are increasingly numerous and it is essential to be ready. Furthermore, in a world where borders seem to be increasingly thickening, we wanted to convey the most international and inclusive message possible, opening the doors to all countries around the globe because we strongly believe that cultural diversity and the heterogeneity of ideas is the greater than riches, even in the scientific field.

The feedback from the participants was exciting, having found a youthful and informal environment and at the same time having had the opportunity to interact with the greatest experts in the astrobiological scientific panorama. With great pride, we report the extremely positive feedback from the latter too, declaring that this event was of unique importance and that it will have to be the first brick in a long series of editions. Furthermore, workshops such as the World Café format in personal branding and emotional intelligence groups were particularly successful, where participants were able to express their thoughts and fears in a friendly and proactive environment.

Given the great success achieved and the great satisfaction (even personal) at the end of this event, we do not intend to keep this edition of the International School of Astrobiology isolated, but we hope that it will be the



first of many, possibly every two years, events. We would like this to become a multidisciplinary and international point of reference and meeting place for all young researchers who share our same passion.

The attendees to the School and the organizing committee with some of the speakers.



From left to right: Dr. Andrew Alberini (organizer, PhD student at INAF-OAA, University of Florence), Dr. Christian Lorenz (organizer, PhD student at INAF-OAA, University of Naples Federico II), Dr. Claudia Pacelli (Researcher at ASI – Italian Space Agency), Dr. Mickaël Baqué (Researcher at DLR – German Aerospace Center), Prof. Daniela Billi (Professor in Astrobiology and Plant Physiology at University of Roma Tre Tor Vergata) and Dr. Jean Pierre de Vera (Director of MUSC -DLR).



Group picture of the local organizing committee and AbGradE committee.



From left to right: Dr. Andrew Alberini (organizer, PhD student at INAF-OAA, University of Florence), Dr. Mitchell Schulte (Director of AMES Research Center – NASA), and Dr. Christian Lorenz (organizer, PhD student at INAF-OAA, University of Naples Federico II).





The Geochemical Domains Map: Concepts, Methods, and Applications

Maurizio Ambrosino

The EU Soil Strategy for 2030 outlines a comprehensive framework and specific measures aimed at protecting and restoring soils while ensuring their sustainable use. It articulates a vision and objectives for achieving healthy soils by 2050, including the exploration of a legally binding "soil passport" to promote the circular economy and enhance the reuse of clean soil. The issuance of a soil passport entails recognizing the physical and chemical characteristics of soil, emphasizing the critical challenges that must be addressed for soil to be classified as clean. In this context, geochemists play a vital role in identifying the natural enrichment or depletion of both macronutrients and potentially toxic elements. Through detailed soil characterization, it becomes possible to differentiate areas with distinct geochemical signatures (geochemical domains) and estimate their natural background levels (NBLs). Defining these geochemical domains and their corresponding NBLs is a crucial first step toward the development of a soil passport.

The NBLs of undisturbed soils are influenced by two primary factors: i) the composition of the parental material and ii) the environmental conditions that have altered this material. Consequently, various lithological units depicted in geological maps have traditionally been employed to delineate areas with differing NBLs.

However, estimating NBLs is far from straightforward. Identical lithologies can exhibit different degrees of weathering, leading to changes in the concentration of chemical elements according to their chemical behavior. Additionally, NBLs can be influenced by secondary processes, such as the introduction of allochthonous materials, which may be of natural origin (e.g., volcanic ash, wind deposits) or anthropogenic. This complexity makes the study of NBLs a challenging endeavor for geochemists,

as the geochemical signatures of soils and the configuration of geochemical domains do not always align with geological units. Nevertheless, tackling these challenging tasks can yield significant results. Recent research conducted by members of SoGel has revealed exceptional NBL values in a mining area (Meloni et al., 2023) and demonstrated variations in NBLs within certain Apennine sedimentary successions (Cicchella et al., 2022). The next step involves identifying an increasing number of soils with varying NBLs (geochemical domains) and spatializing the results to create a comprehensive map of these geochemical domains. This map will serve as an essential tool for soil management, in line with the objectives of the European Soil Strategy.

The SoGel members of the University of Sannio and the University of Naples Federico II have made a first attempt to create a map of geochemical domains, in collaboration with the department of statistics of the University of Girona (Ambrosino et al., 2024). The authors have promoted an approach based on compositional indicators, obtained through the principal balances technique (Martín-Fernández et al., 2018). This method employs equations that identify the key factors influencing soil composition, thereby enhancing the delineation of geochemical domains. The approach was tested in the Volturno river basin (central-southern Italy), where using 15 compositional variables of 887 stream sediment samples the following compositional indicators were obtained:

$$CI_{ALS} = \sqrt{\frac{12}{7}} \ln \left(\frac{(Na \cdot Ti \cdot La \cdot Th)^{\frac{1}{4}}}{(Ca \cdot Mg \cdot Ni)^{\frac{1}{3}}} \right)$$

$$CI_{VLS} = \sqrt{\frac{20}{9}} \ln \left(\frac{(Ti \cdot Ga \cdot La \cdot Mn \cdot Th)^{\frac{1}{5}}}{(Ca \cdot Mg \cdot K \cdot Na)^{\frac{1}{4}}} \right)$$

$$CI_{SLS} = \sqrt{\frac{12}{7}} \ln \left(\frac{(Fe \cdot Co \cdot Mn \cdot Ni)^{\frac{1}{4}}}{(Ca \cdot Mg \cdot Ti)^{\frac{1}{3}}} \right)$$

Leveraging prior knowledge of the study area, it is possible to interpret the information provided by these compositional indicators based on the contrasting chemical elements in the numerators and denominators. Specifically, CI_{ALS} serves as an indicator of volcanic soils, contrasting elements prevalent in volcanic parent materials (numerator) with those found in sedimentary parent materials (denominator). CI_{VLS} indicates the degree of weathering by contrasting low-mobility elements (numerator) with high-mobility elements (denominator). Meanwhile, CI_{SLS} identifies clayey materials, which previous studies in the same area have shown to be enriched in Ni and Co, as well as in Fe and Mn oxides, contributing to the distinctive polychromatic appearance of the Argille Varicolori formation. By utilizing the information from the compositional indicators (CIs), it is possible to establish the geochemical fingerprint of each sample. For example, samples exhibiting high CI_{ALS} and low CI_{VLS} were classified as low-weathered volcanic sediments. Subsequently, the stream sediment samples were categorized into four groups using the random forest algorithm based on the CI values. Following this classification, the results were spatialized, culminating in the creation of the geochemical domain map (Fig. 1A).

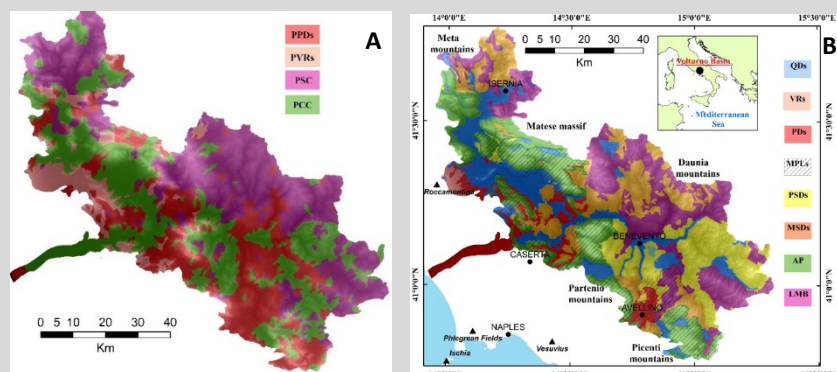


Figure 1. A: Geochemical domains map; B: Geological map. PPDs: Predominant pyroclastic deposits, PVRs: Predominant volcanic rocks, PSC: Predominant siliciclastic component, PCC: Predominant carbonate component, QDs: Quaternary deposits, VRs: volcanic rocks, MPLs: Minor pyroclastic layers, PSDs: Pliocene sedimentary deposits, MSDs: Miocene sedimentary deposits, AP: Apennine platform, LMB: Lagonegro-Molise basin.

Compared to the geological map (Fig. 1B), the geochemical domain map (Fig. 1A) identifies areas with distinct geochemical signatures, regardless of the age or paleogeographic environment in which the parental materials were formed. This representation differs significantly from the geological map and serves as an optimal tool for environmental studies and soil management. Furthermore, the geochemical domain map reveals the geochemical signature of geological formations, providing valuable support for geodynamic and kinematic studies. For instance, in the case study, the Pliocene deposits exhibit a strong Ca-rich component that is absent in the Miocene deposits, which are enriched in the siliciclastic component.

Can this Geochemical Domain Map be considered a soil passport?

No, the geochemical domain map (especially the one shown in Fig. 1, which uses stream sediments samples) cannot be directly considered a soil passport. Instead, it represents the foundation upon which to build the chemical section of a soil passport. By focusing on individual geochemical domains, it becomes possible to identify and remove polluted samples before calculating the NBLs. However, even in its primordial phase, the geochemical domain map can provide valuable information (Fig. 2). For example, NBLs can be estimated for important macronutrients not

associated with anthropic activity (e.g., Na and K), with significant implications for smart agriculture. It is noteworthy that the pyroclastic deposits (PPDs) have potassium concentrations four times higher than the siliciclastic domain. Conversely, the siliciclastic domain presents cobalt (a potentially toxic element) concentrations three

times higher than the carbonate domain (PCC).

Moreover, the maps of compositional indicators (Fig. 2 C,D,E) allow for the identification of the most critical areas, which require further investigation. In the example shown, the most critical areas (where all indicators have similar values) indicate a high mixing of sediments, a phenomenon that may not be present in the soil. Therefore, an improvement to Fig. 2 could be to generate it using topsoil or bottom soil data. However, there are still many aspects to improve to get a clear framework.

One thing is certain: to properly address the needs of the European Soil Strategy and guide environmental studies effectively, this new cartographic tool is necessary. The pioneering work of SoGel members has taken the first steps, which can only be improved by integrating the knowledge of different research groups to achieve a common benefit.

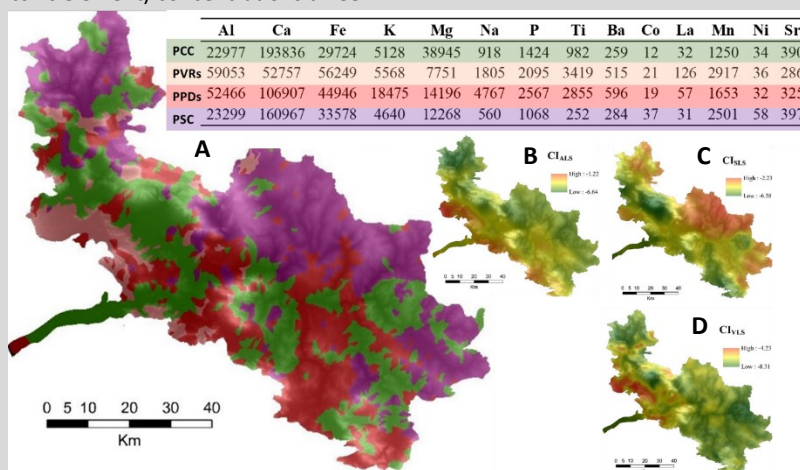


Figure 2. A: Geochemical domains map and NBLs, computed using ProUcl, of the recognized geochemical domains. PCC: Predominant carbonate component, PVRs: Predominant volcanic rocks, PPDs: Predominant pyroclastic deposits, PSC: Predominant siliciclastic component; C: Distribution map of Cl_{ALS} ; D: Distribution map of Cl_{VLS} ; E: Distribution map of Cl_{ELS} .

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2nd Congress of the Italian Geochemical Society

Carlo Cardellini and Francesco Frondini

From 1st to 4th of July 2024, the 2nd Congress of the Italian Geochemical Society "From theoretical to applied geochemistry" was held in Perugia. The event was hosted at the Complesso Monumentale dell'Abbazia Benedettina di San Pietro (Monumental Complex of the Benedictine Abbey of St. Peter), now managed by the University of Perugia and the Foundation for Agricultural Education. The Aula Magna hosted the oral sessions, while two of the three cloisters of the Abbey were used for poster sessions, sponsors' exhibitions and coffee breaks. Finally, lunches were hosted inside the Abbey Museum.

The Congress was divided into four thematic sessions: 1) Computational and Experimental Geochemistry, 2) Environmental Geochemistry, 3) Geochemistry in Geothermal Volcanic and Seismic Areas and 4) Cosmochemistry and Planetary Sciences. Each session was introduced by an invited presentation (Topic 1: Giulio A. Ottonello (University of Genoa); Topic 2: Mauro Masiol (University of Venice); Topic 3: Sergio Calabrese (University of Palermo) and Topic 4: Valentina Galluzzi (INAF.)) and four plenary lectures were given by eminent figures from the national and international scientific scene: Tobias Fischer (University of New Mexico, USA), Donato Giovannelli (University of Naples, Italy), Andrea Bravo (Institute of Marine Sciences, Spain), Maria Cristina De Sanctis (Italian National Institute for Astrophysics, Italy).

During the opening ceremony of the Congress, the SoGel 2024 Prizes were awarded for the best doctoral theses (completed in the academic years 2021-2022 and 2022-2023 and/or by 31 May 2024). The Prize Panichi for Hydrogeochemistry was awarded to Lisa Ricci. Giulio Bini was awarded with Prize Tonani for Applied Geochemistry and Geothermal Energy. The Prize Tongiorgi for Isotopic Geochemistry was awarded to Stefano Natali, and eventually the Prize Galli on Magmatic Processes was bestowed ex-aequo upon Abimbola Chris Ogunyele and Simone Paternostro.

Approximately 120 people attended the conference with a very large presence of young people, about 43% were PhD or post-docs students, and a total of 109 contributions, including invited presentations, were presented. These data, in continuity with the previous congress of Genoa, held in 2022, testify to the existence of a young, dynamic and steadily growing Italian geochemistry community, which involves people from both universities and major research bodies (CNR and INGV in particular). All contributions are published in a special issue of INGV Miscellanea which can be downloaded free-of-charge at: <https://editoria.ingv.it/miscellanea/2024/miscellanea81/>.

In addition to the scientific program, the congress included a number of social events, such as the icebreaker party (on the 1st of July), the social dinner (on the 3rd of July) and guided tours to the Abbey.



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These events contributed to the development of relationships between researchers in an informal and convivial atmosphere. The event was sponsored by local authorities (Municipality and Province of Perugia and Region of Umbria), as well as by the University of Perugia, the Foundation for Agricultural Education of Perugia, the University of Florence, INGV, CNR-IGG, and by private sponsors Encotech, Pollution Analytical Equipment and Thermo Fisher. The contribution of all the patrons, at various levels, was fundamental to the success of the congress. During the closure ceremony all the actors of this event were acknowledged and it was accepted the candidature proposed by Enrico Dinelli and Nicolas Greggio. Consequently, the 3rd Congress of the Italian Society of Geochemistry will be held in 2026 at Ravenna.





Memorial keepsakes

Prof. Maria Bianca Cita

Elisabetta Erba and Rodolfo Carosi

September 12, 1924 – August 12, 2024 - The "very long story" of Maria Bianca Cita has come to an end. There are many memories of Maria Bianca and it is difficult to summarize her exceptional figure as a rigorous, curious and passionate scientist. Geology attracted and involved her from a very young age. Maria Bianca was undoubtedly a "PRIMA DONNA", the undisputed protagonist of geological adventures, often at the forefront: she was a true pioneer, a forerunner and a teacher of Geology in Italy. She was the first student to enroll in 1942 in the Degree Course in Geological Sciences, newly established at the University of Milan, obtaining (the first graduate) the degree in July 1946 with the highest score. She began her career as a field geologist, earning a teaching qualification in Geology in 1955. As a graduate, she discovered Micropaleontology and became the first to apply and spread the use of planktonic foraminifera for biostratigraphic purposes in Italy, allowing for vast academic and industrial applications. Maria Bianca Cita quickly became an internationally renowned stratigrapher. She was the first in Italy to address the issues of the Cretaceous/Paleogene boundary in the mid-1950s and her studies confirmed the applicability of planktonic foraminifera zoning, which became the stratigraphic "standard" with worldwide validity for the Lower Cretaceous - Current interval. She published the first Italian textbook of Micropaleontology. Maria Bianca was the first foreigner (and one of the first two women) to participate as a Paleontologist in the second oceanographic cruise (Leg 2, September 1968) of the Glomar Challenger drilling vessel within the US Deep Sea Drilling Project (DSDP). She participated in other DSDP cruises in 1970 and 1975 in the Mediterranean

and in 1976 in the North Atlantic. The 1970 expedition led to the fundamental and unexpected discovery of the Messinian evaporites buried under the bottom of the Balearic, Tyrrhenian, Ionian and Levantine basins. Maria Bianca contributed to the formulation of the theory of the desiccation of the Mediterranean in the Messinian. She organized seven cruises with the ship Bannock in the Eastern Mediterranean in the years 80-89. The expeditions she directed were attended by international teams and numerous students who would later become internationally renowned marine geologists. In the 80s, Maria Bianca promoted Italy's participation in the Ocean Drilling Program (ODP), contributing to the establishment of a European Consortium for the ODP composed of 12 "small" countries, under the aegis of the European Science Foundation. At the same time, she founded ODP-Italy. Member of the Italian Geological Society since 1945, Maria Bianca was the first female President in 1989-1990. At the University of Milan, in 1982 she was elected the first Director of the newly established Department of Earth Sciences. Maria Bianca is one of the most internationally renowned Italian personalities in the field of Earth Sciences: she has been a leading scientist as documented by over 300 publications of great importance on cutting-edge topics of geological research in almost seventy years (1947-2014). For her research she has received numerous national and international awards: the Feltrinelli Prize (Accademia dei Lincei), Honorary Member of the American Geological Society and the F.P. Shepard Medal of the Society for Sedimentary Geology for her "Excellence in Marine Geology".

Honorary Member of the Geological Society of America (since 1987), of the International Union for Quaternary Research (since 2000) and of the Italian Paleontological Society. She was a National Member of the Accademia Nazionale dei Lincei and an Effective Member of the Istituto Lombardo - Academy of Sciences and Letters. Maria Bianca was appointed Professor Emeritus of Geology at the University of Milan in 1998, after having been Lecturer (1955) and Full Professor (since 1973). She had the ability to stimulate and transmitting great enthusiasm. Thanks to Maria Bianca, the students who have developed their scientific interests in the fields of Geology, Stratigraphy, Micropaleontology and Marine Geology, are numerous, and many have prominent positions in Italian and international universities as well as in research institutions. Maria Bianca has been an example and a source of inspiration for generations of students to whom she has given incredible opportunities for professional growth. It is difficult to face the void of her passing.





Memorial keepsakes

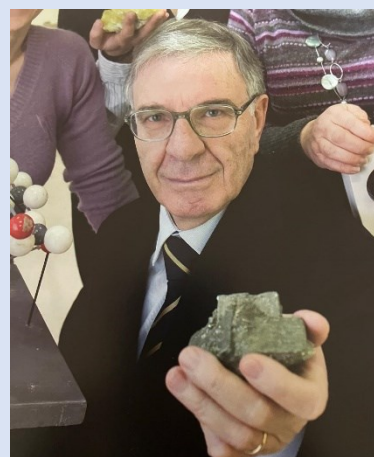
Prof. Filippo Vurro

Anna Garavelli

It is with great sorrow to inform you that Prof. Filippo Vurro (1940-2024) passed away. He was full professor of Mineralogy at the University "Aldo Moro" of Bari. On the 15th of January, 2024, Filippo had a cerebral hemorrhage and in a few hours he left this earth. I remember him as an intelligent and empathetic person, brilliant, funny, kind and correct who always left a mark on all those who were fortunate enough to collaborate with him from both a professional and human point of view. Filippo Vurro graduated in Chemistry in 1965, and from the following year he was Director of the Chemical Laboratory of the Air Force of the 3rd Air Region. He was discharged in 1985, with the rank of Colonel of the Aeronautical Engineering. He then became Associate Professor at the University of Bari. He chaired Mineralogy for students of Natural Sciences, Geological Sciences and Science and Technology for the Diagnostics and Conservation of Cultural Heritage. He was among the first to understand the

importance of mineralogical applications to non-traditional fields, he greatly contributed to the establishment of the University Diploma in Technician for Diagnostics applied to the Restoration and Conservation of Cultural Heritage, of which he was coordinator from 1999 to 2004. Subsequently, he continued to be the Coordinator of the Course and strongly contributed to its subsequent transformation into a Qualifying Degree in Restoration of Cultural Heritage. He worked for a long time in the field of volcanic surveillance. As Head of the INGV Research Unit, he pinpointed the importance of mineralogy even in this field, emphasizing the role of fumarolic minerals as geochemical indicators of specific parameters useful for monitoring the activity of active volcanoes. His scientific activity focused on various sectors: systematic and environmental mineralogy studies, fumarolic mineral studies, environmental geochemistry studies, archaeometry investigations.

He contributed to the discovery and description of numerous mineralogical species and has a mineral, vurroite, dedicated to him. Filippo, with his intellectual honesty, kindness, professionalism and above all great humanity, is leaving a great void in those who knew him. May the earth be light on you.





Members' Publications

List of Members' Publications

referred to the period May 08, 2024 – September 4, 2024

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