



Travertine quarry in Tivoli (Latium, Italy). Photographer: Orlando Vaselli.

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Letter from the President

Orlando Vaselli

Dear Friends and Colleagues,

This is the first issue of our GeochemNewsletter for 2024 and we have a new important event, i.e. the **Second Congress of the Italian Society of Geochemistry**. It will be held in the beautiful city of Perugia from the 1st to the 4th of July. The Local Organizer committee consists of 10 members: Alessandra Ariano (UNIPG); Carlo Cardellini (UNIPG); Francesco Frondini (UNIPG); Monia Procesi (INGV); Lisa Ricci (UNIPG); Giuseppe Saldi (UNIPG); Mauro Tieri (UNIPG); Stefania Venturi (UNIFI); Azzurra Zucchini (UNIPG); Marino Vetuschchi Zuccolini (UNIGE) whilst the Scientific Committee is composed by: Carlo Cardellini (UNIPG); Enrico Dinelli (UNIBO); Cinzia Federico (INGV); Francesco Frondini (UNIPG); Luigi Marini (STEAM srl); Barbara Nisi (CNR-IGG); Elena Pavoni (UNITS); Giuseppe Saldi (UNIPG); Daniela Varrica (UNIPA); Orlando Vaselli (UNIFI); Martina Zucchi (UNIBA). The two committees have decided to have 4 topics with the following conveners:

- 1) *Experimental and Computational Geochemistry*: Devis Di Tommaso, Caterina Gozzi and Mattia La Fortezza.
- 2) *Environmental Geochemistry*: Maurizio Barbieri, Elisabetta Dore and Nicolas Greggio.
- 3) *Geochemistry of volcanic, geothermal and seismically active areas*: Alessandra Correale, Anna Gioncada and Andrea Ricci
- 4) *Cosmochemistry and Planetary Sciences*: Nadia Balucani, Martina Casalini and Maximiliano Fastelli

For each topic, a speaker has been invited: 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).

Additionally, we will have 4 plenary sessions: Andrea Bravo (CSIC-Spain), Martina De Sanctis (INAF-Italy), Tobias Fisher (University New Mexico, USA) and Donato Giovannelli (University of Naples, Italy).

A few days ago, the deadline for the submission of abstract expired and we received 89 contributions, slightly higher than those we had in Genoa in 2022 when most congresses, symposiums, workshops and so forth were still affected by the sanitary emergence. In 2024, as you know, a lot of events already passed or are about to come at national (e.g. the Joint Congress of the Italian Geological Society, the Rittmann Conference) and international (e.g. EGU-2024, Cities on Volcanoes, Goldschmidt) level. Thus, I am really satisfied about this achievement and I hope to see more participants than those we had in Genoa when about 120 researchers attended the 1st Congress of the Italian Society of Geochemistry. I would like to remind you that the early bird registration is on the 26th of May. Thus, hurry up to register! The final deadline to pay the inscription fees is on the 23rd of June. No payment will be accepted at the desk of the congress.

Here, below there is the general time schedule of the event. Presently, we are about to define the final program which will be announced by the next week.

The Congress will be held in the rooms of 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.

Differently to what was done in Genoa, a poster session will be organized in two cloisters of the Monumental Complex. Here, the stands of the sponsors as well as the catering will take place. The Main Hall will host the oral sessions.

Presently, the event is sponsored by the local authorities (Municipality and Province of Perugia and Umbria Region), Unipg, Dipfisgeo-Unipg, Unifi, DST-Unifi, INGV, CNR and CNR-IGG while, concerning the private companies we have Encotech and Thermo Fisher.

The last but not the list is the social dinner that will be held on the 3rd of July.



01/07/2024	02/07/2024	03/07/2024	04/07/2024
	Oral sessions 8:30-10:30	Oral sessions 8:30-10:30	Oral sessions 8:30-10:30
	Coffee break 10:30-11:00	Coffee break 10:30-11:00	Coffee break 10:30-11:00
Registration From 11:00	Oral sessions 11:00-12:00	Oral sessions 11:00-12:00	Oral sessions 11:00-12:30
	Plenary Lecture 12:00-13:00	Plenary Lecture 12:00-13:00	Closing of the Congress 12:30-13:00
	Lunch break 13:00-14:30	Lunch break 13:00-14:30	
Opening Ceremony 14:30-15:00			
PhD thesis awards 15:00-16:00	Oral sessions 15:30-17:00	Oral sessions 15:30-17:00	
Plenary Lecture 16:00-17:00			
Coffee break 17:00-17:30	Coffee break 17:00-17:30	Coffee break 17:00-17:31	
Plenary Lecture 17:30-18:30	Poster session 17:30-19:00	Poster session 17:30-19:00	
Icebreaker		Social Dinner	



In a few days, the **International Astrobiology School 2024 - 10th AbGradE Anniversary** (<https://florenceastrobio.wixsite.com/school>) is about to start. The School will take place from the 21st to the 24th of May, 2024, and is organized in collaboration with AbGradE (Astrobiology Graduates in Europe), which brings together European Bachelor's, Master's, PhD students and post-doc researchers working and studying in the field of astrobiology, to celebrate the association's 10th anniversary. Only 50 attendees from all over the world were allowed to the School which will be held in the the Poccetti Hall at Museo degli Innocenti of Florence which was the ancient women's refectory and takes its name from the fresco la Strage degli Innocenti painted in the 17th century by Bernardino Poccetti. The Italian Society of Geochemistry sponsored the event in continuity with one of the topic of the Congress of Perugia, since many of us are also focusing in extra-terrestrial issues.

Another important event where the Italian Society of Geochemistry is involved is the **Granulites & Granulites Conference** which will be held in Verbania from the 3rd to the 6th of September, 2024. Antonio Langone is one of the organizers of this conference. Pre- and post-excursions will be organized in Ivrea-Verbano Zone (Italian Alps), Serre Massif, Capo Vaticano Promontory and Palmi area (Calabria). Mid-conference activities will be regarding: "A walk across the Moho", "A geo-heritage marble" and "Visit to the picturesque botanical gardens of Villa Taranto". Additionally, a Workshop on "Phase Equilibrium Modelling with MAGEMin" is also organized. More information can be

found at <https://granulites2024.sfmc-fr.org>.

Finally, several members of our Society are involved in organizing sessions during the joint congress of the Italian Geological Society and the Italian Society of Mineralogy and Petrology, entitled "*Geology for sustainable management of our planet*" at the Bari University Campus from the 3rd to the 5th of September 2024. A similar participation of our members in organizing sessions is related to the Rittmann Conference which will be held at the spectacular Benedictine Monastery of Catania from the 18th to the 20th of September, 2024.

What about the content of this newsletter? Well, we have the ninth episode of "R" by Caterina Gozzi who is always available to provide interesting insights about this free software environment for statistical computing and graphics. This time the theme is: Exploring Statistical Tests in R. Then, Marco Taussi and Francesco Capecciacci have a brief report about their visit to Argentina where they attended a meeting as speakers and could collected some water and gases in the Jujuy Province in the framework of a CUIA-CONICET project (Consorzio interUniversitario Italiano per l'Argentina and Consejo Nacional de Investigaciones Científicas y Técnicas) between Argentina and Italy.

Lorenzo Chemeri reports about the situation of our social platforms. Instagram, Facebook, Twitter and LinkedIn. According to his surveys, our visibility is increasing and could be much more if more contributions would be provided by our members. I guess you how much is important to be "socially present", not only for our

Society but also for the geological community due to decreasing numbers of new students that almost all our departments are suffering. Many thanks are due to Lorenzo and all the other young people who keep up-to-date our "socials".

As you know, Paolo Censi has recently passed away and Daniela Varrica provided an obituary to remember this friend and colleague. RIP!

Finally, once again I have to thank Jacopo Cabassi who dedicates a lot of his time in assembling the list of publication of our members. The present list of papers is from the 1st of January to the 7th of May, 2024. We decided to change the procedure that was previously adopted. Now, Jacopo is using Scopus and all the publications there reported are in the list you can find in this newsletter. As you know, Scopus has a delay between the publication of a paper and the appearance in this database. This means that some recently published papers (pre-7th of May, 2024) may not be present but not worry, they will be appearing in the text issue of the newsletter. A special thanks to Stefania Venturi for handing all the newsletter issues.

I am very grateful to all those who contribute to maintain our social alive and more contributions are expected. I would also appreciate the inputs by the young researchers in submitting a couple of pages to the GeochemNewsletter about their scientific activity, relevant field works or excursions.



Members' Activities

Geothermal exploration in Northwestern Argentina

Marco Taussi and Francesco Capecchiacci

The production of energy from geothermal sources has changed a lot over the last few decades, mainly because of the different characteristics of the various geothermal systems and the technology available to produce energy from these resources. Currently, the international energy market is promoting the exploitation of low- and medium-enthalpy geothermal resources as a viable alternative source of supply to traditional ones, both for direct electricity production and for specific industrial and domestic applications that require heat since it has been shown that these uses are of utmost importance for environmental, economic, and sustainable development of territories. After a long period of little activity, numerous initiatives to reactivate the geothermal sector have recently flourished in Argentina.

Lately, the Province of Jujuy, located in the Northwestern part of the country and which encompasses four geographical and geological contexts (Northern Puna, Eastern Cordillera, Subandean Ranges, and Santa Barbara system; Fig. 1) has seen the development of various new studies related to the geochemical characterization and potential assessment of numerous geothermal fields, following the "golden" years between the '70s and '90s of geothermal exploration in the area. The results of these preliminary studies suggest a geothermal potential of great interest for these natural systems, with geothermometric estimates suggesting reservoir temperatures of about 150 °C (Peralta Arnold et al., 2020).

In this context, a new study has recently been funded through a CUIA-CONICET project (Consorzio interUniversitario Italiano per l'Argentina and Consejo Nacional de Investigaciones Científicas y Técnicas)

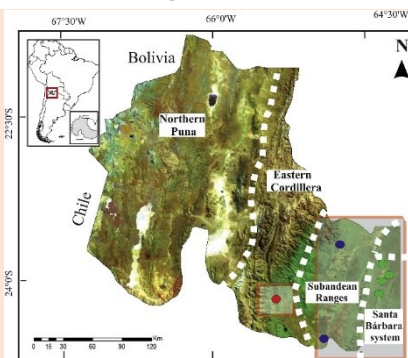


Fig. 1 Geographical map of Jujuy province showing the main geological domains (modified from Peralta Arnold et al., 2020).

between Argentina and Italy. The main aim of the proposed study is to identify the relationship between hydrothermal fluids and tectonic structures associated with the Cretaceous rift of the region. The primary study methods are focused on diffuse CO₂ emissions from the ground, the geochemistry of hydrothermal fluids and the detailed analysis of the main tectonic structures and stratigraphic setting, also in association with the local geothermal gradient estimations using data from hydrocarbon wells, widespread in the zone.

In April 2024, some of the SoGel members from the Universities of Florence (Franco Tassi, Francesco Capecchiacci, and Stefania Venturi) and Urbino (Marco Taussi), in collaboration with researchers of the Universities of Jujuy (Yesica Peralta Arnold, Maria Gabriela Franco, Juan Pablo Villalba, and Pablo Caffè) and Buenos Aires (Antonella Massenzio, Maria Clara Lamberti), visited the targeted geothermal areas (Fig. 2) of the Province of Jujuy to sample hydrothermal gases and waters (Fig. 2a-b-c), and measure soil diffuse CO₂ fluxes through the accumulation chamber method, coupled with the analyses of the Carbon isotopic content of the interstitial gas (Fig. 3a-b).

Numerous samples have been collected whose analyses are presently in progress. The results will allow to reconstruct a fluid circulation model to evaluate the potential and the most likely geothermal uses of the fluids, encouraging local communities to exploit the thermal energy source.



Fig. 2 a) Siete Aguas well, with hot water (70-72 °C) continuously pumped out at ~1 L/min; b-c) Gas sampling from bubbling pools.



Fig. 3 CO₂ flux measurements and interstitial gas collection in the field.

During the visit, a workshop was also held to explore the geothermal potential of the Province of Jujuy and inform and disseminate the main benefits of using this resource with very low environmental impact and high efficiency (Fig. 4).

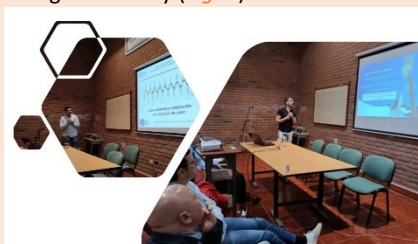


Fig. 4 Some moments of the workshop held in Jujuy.

References: Peralta Arnold Y., Franco M.G., Tassi F., Caffè P.J., Jofre C.B., Claros M., Villalba Ulberich J.P., Rizzo A.L., Cabassi J. (2020). Geochemical features of hydrothermal systems in Jujuy Province, Argentina: hints for geothermal fluid exploration. *J. South Am. Earth Sci.*



Members' Activities

So.Ge.I. Social Platforms

Lorenzo Chemeri

Currently, the Italian Society of Geochemistry is active on four social platforms: Instagram, Facebook, Twitter and LinkedIn. The contents are mostly focused on research activities carried out by our members and concerns sampling activities to national to international conference attendances. On average, we post two contents per week which are kindly provided by a restricted number of members who act as link between the social group of the Italian Society of Geochemistry and the different institutions (i.e., universities and research institutes).

On Instagram, the SoGel page (@societageochemica_it) has more than 400 followers, with an increase of about +20% with respect to the last report presented during the Joint Congress of the Geological Italian Society, the Italian Mineralogy and Petrology Society, the Italian Society of Geochemistry and the Italian

Association of Volcanology that was held last September in Potenza. An average of 50 likes per post and an engagement rate of 11%, which is 3% higher than the average engagement for similar pages were attained. In the last 90 days, the Instagram profile of the Italian Society of Geochemistry reached 972 accounts with a total of almost 14.000 views to our contents. The profile was visited 565 times for a total of 1240 interactions. Regarding Facebook, we have a total of 1.106 followers and 1.003 likes at the page. In the last 90 days, our contents reached almost 3.500 accounts (80% of which were not followers) for a total of more than 1.500 interactions (i.e., likes, comments and shares). Instagram is the preferred social platform for users below 35 years old, representing more than 75% of the total audience. On the other hand, Facebook is preferentially reaching an audience with an age higher than 35, more than 55%.

On Twitter, the SoGel page (@SocietaGe) has 97 followers and an average view ranging between 40 to 50. Finally, on LinkedIn, the Italian Society of Geochemistry page has a total of 740 followers with an increase of 240 in the last year; with 910 profile visits and more 35.000 interactions. We may say that our small community has a good and appreciate relevance in terms of socials but it can keep growing if more contributions by our members would be submitted. Consequently, please feel free to submit your scientific activity to our social accounts.

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<https://it.linkedin.com/company/societageochemicaitaliana>



R-Corner

Caterina Gozzi

Exploring Statistical Tests in R

Basic concepts

In geochemistry, statistical tests serve as valuable tools for evaluating hypotheses and determining the significance of relationships between geochemical variables or differences in data. In this R corner, our aim is to summarize the fundamental concepts and essential steps of statistical testing in general, accompanied by an application example of the Kolmogorov-Smirnov test in R.

In hypothesis testing, we typically work with a **null hypothesis** (H0) and an **alternative hypothesis** (HA or H1). The null hypothesis generally reflects the status quo or a default assumption, while the alternative hypothesis is what we aim to test. For example:

- The **null hypothesis** might state that there is no significant difference or relationship between two variables.
- The **alternative hypothesis**, on the other hand, contradicts the null hypothesis and proposes that there is indeed a significant difference or relationship between the two variables.

However, the specific form of the null and alternative hypotheses depends on the type of test being conducted. The test results provide a **p-value**, which measures the strength of evidence against the null hypothesis. A low p-value (usually ≤ 0.05) indicates strong evidence against the null hypothesis, leading to its rejection. Conversely, a high p-value (> 0.05) suggests weak evidence against the null hypothesis, leading to its acceptance.

It is crucial to select an appropriate statistical test based on the characteristics of the geochemical data and the research question. Based on the assumptions they make about the underlying distribution of the data, tests can be categorized as:

- **Parametric tests** - These tests assume that the data follow a specific probability distribution, typically the normal distribution with known parameters like mean and variance. Examples include the t-test for comparing means and the chi-square test of independence for categorical data.
- **Nonparametric tests** - Nonparametric tests make fewer assumptions about the underlying data distribution or require fewer parameters to be specified. They are used when data do not meet the assumptions of parametric tests, such as non-normality, skewness, or the presence of outliers. Examples of nonparametric tests include the Wilcoxon signed-rank test for paired data and the Kruskal-Wallis test for comparing multiple groups.

The Kolmogorov-Smirnov test

A commonly used test in statistical analysis is the **Kolmogorov-Smirnov test** (Conover, 1971; Marsaglia et al., 2003). It can be applied to determine if two samples derived from the same distribution or to compare a sample distribution to a reference distribution (e.g., a theoretical distribution such as the normal distribution). This test works by comparing the cumulative distribution functions (CDFs) of the two distributions being tested. It quantifies the largest vertical difference between the two CDFs, known as the D statistics. If this last exceeds the critical value at a chosen significance level (e.g., 0.05), then the null hypothesis is rejected. This suggests that the two samples likely come from different distributions.

In R, you can perform the Kolmogorov-Smirnov test using the `ks.test()` function, which is included in the base R statistics package “`stats`”. The null hypothesis of the test is that the two samples derive from the same distribution or from a specific reference distribution. This function allows to conduct two different tests (one-sample or two-sample), which are reported below:

- **One-sample Kolmogorov-Smirnov test:** this test evaluates whether a sample comes from a specific reference distribution. In the code example (1), “`x`” represents your sample data, “`pnorm`” specifies the theoretical distribution you want to test (in this case, the normal distribution) and “`mean = mean(x)`” and “`sd = sd(x)`” are the parameters (mean and standard deviation) of the theoretical distribution.

Download and install R and R Studio



R is completely free software that can be used on Linux, Windows and Mac operating systems. Visit <https://www.r-project.org> and follow the instructions to download the version of R compatible with your system.



R Studio provides an integrated environment for R with numerous features to improve the user experience and make using R easier. After installing R, you can download and install R Studio for free from <http://www.rstudio.com/>.

```
set.seed(27) # random number generator (1)
# Generate a sample of 100 data points from a normal
distribution
x <- rnorm(100)
# Perform one-sample Kolmogorov-Smirnov test
ks.test(x, "pnorm", mean = mean(x), sd = sd(x))

# Test results
-----
Asymptotic one-sample Kolmogorov-Smirnov test
data: x
D = 0.037711, p-value = 0.9989
```



The `ks.test()` function returns a test result object containing the test statistic D , the p -value, and the name of the test performed. We can interpret the p -value to determine whether to reject or accept the null hypothesis. In the example, the p -value is 0.99. This high p -value suggests that there is no evidence to reject the null hypothesis, indicating that the data distribution is likely normal, as expected based on how the data was generated.

- **Two-sample Kolmogorov-Smirnov test:** this test assesses whether two independent samples come from the same distribution. In the code example (2), “ x ” and “ y ” are two independent samples generated from a normal and a gamma distribution, respectively. The test compares the distributions, and the results show a very low p -value ($3.61e-12$). This suggests that there is strong statistical evidence to reject the null hypothesis and conclude that the two distributions are significantly different from each other.

```
set.seed(27) # random number generator (2)
x <- rnorm(100) # Sample 1 from a normal
distribution
y <- rgamma(100,2,3) # Sample 2 from a gamma
distribution
ks.test(x, y) # Perform two-sample Kolmogorov-
Smirnov test

# Test results
-----
Asymptotic two-sample Kolmogorov-Smirnov test
data: x and y
D = 0.52, p-value = 3.612e-12
```

In conclusion, whether the Kolmogorov-Smirnov test in R is considered parametric or nonparametric depends on how it is used, and what assumptions are made about the underlying distributions during its application. When used without explicit distributional assumptions, it represents a robust nonparametric method for comparing empirical distributions.

References

- Conover W.J (1971). Practical Nonparametric Statistics. New York: John Wiley & Sons. Pages 295–301 (one-sample Kolmogorov test), 309–314 (two-sample Smirnov test).
- Marsaglia G., Tsang W.W. and Wang J. (2003). Evaluating Kolmogorov's distribution. Journal of Statistical Software, 8/18. doi:10.18637/jss.v008.i18.



Memorial keepsakes

Prof. Paolo Censi

Daniela Varrica and Orlando Vaselli

Prof. Paolo Censi, associate professor of geochemistry of the Department of Earth and Marine Sciences of the University of Palermo, passed away prematurely at the age of 64. His career began in the early 1980s in the Laboratory of Isotope Geochemistry at Institute of Mineralogy, Petrography and Geochemistry, where he intimately collaborated with Prof. Antonio Longinelli. The research activity of Paolo, over the last forty years, has ranged in numerous areas of geochemistry, from initial studies in the isotopic field, to environmental and medical geochemistry and then, he focused his scientific activity in investigating the geochemical behavior of rare earths.

His contributions to the most prestigious international scientific journals are numerous and innovative. With him goes a person who transmitted scientific rigor and

passion for research to students and young researchers, and could still have given much to the world of research. The professor. Paolo Censi left a void within the Department also due to his integrity and his ability to face life with the right amount of irony.

In 1997, Paolo helped the group of Geochemistry to install the separation and purification rack for preparing the samples for the isotopic analysis of oxygen and hydrogen in water, carbon and oxygen in carbonates and carbon in CO₂ and then, he also intervened during the set-up of the mass spectrometer. You have to imagine that we were two of us who had never worked with isotopes. Well, while assembling the separation and purification rack, Paolo realized that we were completely ignorant on how the vials, the sample-holders and as forth had to be placed.

However, we were having a good time and we were enjoying but, after several errors we did, he said while smiling: "Siete dei bovini, braccia strappate all'agricoltura" that in English sounds as: "You are like bovines, your arms have been torn away from agriculture". Paolo will always remain in our hearths!

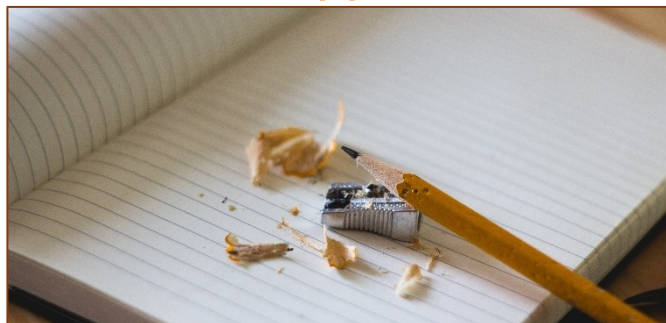
Daniela Varrica (UNIPA)

Orlando Vaselli (UNIFI)





Events and Opportunities



Schools and Thematic Days

- ▶ **Vulcano Summer School on *in situ* measurements and sampling of volcanic gases 2024**

Vulcano Island (Italy), 17-21 June 2024

[1st circular](#)

- ▶ **International Astrobiology School 2024 - 10th AbGradE Anniversary**

Florence (Italy), 21-24 May 2024

[Website](#)



Conferences and Congresses

- ▶ **2nd Congress of the Italian Geochemical Society (So.Ge.I.)**

From theoretical to applied geochemistry

Perugia (Italy), 1-4 July 2024

[Website](#)

- ▶ **Granulites & Granulites Conference**

Verbania (Italy), 3-6 September 2024

[Website](#)

- ▶ **SGI-SIMP Joint Congress**

Geology for sustainable management of our planet

Bari (Italy), 3-5 September 2024

[Website](#)

- ▶ **XVIII Convegno Nazionale della Sezione “GIT - Geosciences and Information Technologies”**

Malnisio (Italy), 17-19 June 2024

[Website](#)



Members' Publications

List of Members' Publications

referred to the period Jan 01, 2024 – May 07, 2024

- Abrunhosa, M., Saraiva, R., Fernández-García, M. F., Carrillo-Rivera, J. J., Pérez, M., **Barbieri, M.** & Chaminé, H. I. (2024). Groundwater Management: Sustainability, Environment and Hydrogeoethics. *Discover Applied Sciences*, 6(5). <https://doi.org/10.1007/s42452-024-05853-x>
- Albanese, S., Cicchella, D.,** Lima, A. & de Vivo, B. (2024). Geochemical mapping of urban areas. In *Environmental Geochemistry: Site Characterization, Data Analysis, Case Histories, and Associated Health Issues* (pp. 183–209). <https://doi.org/10.1016/B978-0-443-13801-0.00004-9>
- Ali-Taleshi, M. S., Riyahi Bakhtiari, A. & **Masiol, M.** (2024). The possible emission sources and atmospheric photochemical processes of air pollutants in Tehran, Iran: the role of micrometeorological factors on the air quality. *Air Quality, Atmosphere and Health*, 17(3), 525–539. <https://doi.org/10.1007/s11869-024-01499-1>
- Azizi, R., Barhoumi, A. & **Mancini, A.** (2024). New insight on the structural architecture of northern Tunisia with a multidisciplinary approach: Association of Miocene piggy-back basin and active Plio-Quaternary out-of-sequence thrusts. *Marine and Petroleum Geology*, 160. <https://doi.org/10.1016/j.marpetgeo.2023.106639>
- Bergamin, L., di Bella, L., Romano, E., D'Ambrosi, A., di Fazio, M., Gaglianone, G., Medeghini, L., Pierdomenico, M., Pierfranceschi, G., Provenzani, C., Rampazzo, R., Rinaldi, S. & **Spagnoli, F.** (2024). Habitat partitioning and first microplastic detection in the Argentarola marine cave (Tyrrhenian Sea, Italy). *Regional Studies in Marine Science*, 74. <https://doi.org/10.1016/j.rsma.2024.103547>
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- Biagi, R., Ferrari, M., Venturi, S.,** Sacco, M., **Montegrossi, G.** & **Tassi, F.** (2024). Development and machine learning-based calibration of low-cost multiparametric stations for the measurement of CO₂ and CH₄ in air. *Heliyon*, 10(9). <https://doi.org/10.1016/j.heliyon.2024.e29772>
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