



GEOCHEM NEWSLETTER

September 2023, n.14

IN THIS ISSUE

▶ Letter from the President

Orlando Vaselli

Pages 2-3

Greetings and Communications from the President of the Italian Geochemical Society.

▶ Members' Activities

○ *Vulcano Summer School 2023*

Stefania Venturi

Page 4

○ *4th CAMGEO School*

Barbara Nisi and Orlando Vaselli

Page 5

○ *First National Italian Workshop on Fluid and melt Inclusions*

Francesco Maria Lo Forte

Page 6

▶ R corner

○ *Fitting distributions: R package "fitdistrplus"*

Caterina Gozzi

Pages 7-8

▶ Events and Opportunities

Pages 9-10

Special Issues, Conferences and Congresses of potential interest.

▶ Members' Publications

○ *List of Members' Publications (IF \geq 2)*

referred to the period Apr 22, 2023 – Aug 21, 2023

Pages 11-17

So.Ge.I. – ITALIAN GEOCHEMICAL SOCIETY



Contacts

President:

Orlando Vaselli

presidenza@societageochemica.it

orlando.vaselli@unifi.it

Secretary:

Marino Vetuschi Zuccolini

segreteria@societageochemica.it

Presidential Council:

Stefano Caliro

stefano.caliro@ingv.it

Enrico Dinelli

enrico.dinelli@unibo.it

Barbara Nisi

barbara.nisi@igg.cnr.it

Webmaster:

Stefania Venturi

stefania.venturi@unifi.it



Letter from the President

Orlando Vaselli

Dear Friends and Colleagues,

this 2nd edition of our GeochemNewsletter will be focusing on the different activities that the Italian Society has done after the first issue we published in April 2023.

In May, in Palermo it was held the First National Workshop on Fluid and Melt inclusions. In this newsletter, Francesco Maria Lo Forte prepared a summary report of this event that was partly financially supported by the Society. Let me jump for a moment to October and December 2023 when two conferences will be held in Naples and Pisa, respectively. The annual meeting BeGeo (*Sustainability and risk: BeGEO scientists on the road to the future*) is indeed planned from the 3rd to the 5th of October and fully organized by PhD students and young researchers while from the 29th of November to the 1st of December the young geological community of Pisa has organized the GeothermiX Conference (*How Earth's heat is studied and impacts society organized*), partly sponsored by the Society. In the three cases of Palermo, Naples and Pisa, it is really appreciated the fact that the young generation is amazingly active and able to realize such events involving the young and old (oops!), I mean, more experienced researchers.

Going back to June (19-23) 2023, the very-well consolidated International Summer School on *Sampling and Measuring Techniques of Volcanic Fluids: Science meets Practice* was held in the Island of Vulcano. The number of participants was incredibly high. Almost 80 students attended this event organized by the Department of Earth Sciences of Florence and INGV-Palermo. More than 20 senior researchers gave classes and showed classical and new techniques directly in the fields. The participants could touch with their hands the thrill of measuring the CO₂ flux, the atmospheric gases by sensors and specific instrumentations for concentrations and stable isotopes, sampling the fumarolic

gases and cold and thermal waters. Stefania Venturi summarized in this issue the main activities associated with the International Summer School.

This newsletter also includes the success of the 4th edition of CAMGEO (*Sampling and Analysis of Geological Matrices*) that was held at Abbadia San Salvatore from the 11th to the 14th of July. Participants and teachers benefitted of the hospitality of the Mining Museum Park. We wish to thank the Director of the Museum Park, Dr. Daniele Rappuoli, for both allowing the use of the museum spaces and visiting the former mining area of Abbadia San Salvatore, which is presently under remediation operations.

The Joint Congress of Potenza (September 19-21) will bring together four Italian geological societies (Geological Society, Mineralogy and Petrology Society and Geochemical Society) and associations (Volcanology Association). The amazingly high participation to this event is also due to the dedication of the 4 members who were part of the Scientific Committee and the many So.Ge.I. members who proposed a large number of sessions that gained a very high number of abstracts.

During this Joint Congress, the General Assembly of So.Ge.I. will be held. For the first after the COVID, the assembly will be face-to-face and I hope in a large participation even because on the 31st of December 2023 the president and committee expire and we have to think about the next four-year period (2024-2027). For the first time, the election will be done by ELIGO an Electronic and online voting platform that has been purchased for this special occasion. The assembly will also be the moment where a short report about the members and the financial situation of our Society will be done by Marino Vetuschi Zuccolini and we will have to discuss whether our Society has to subscribe to the RUNTS (Registro Unico Nazionale del Terzo Settore. Literally: Single

National Register of the Third Sector...it does not sound as a good translation, does it?). We are presently evaluating if we are forced to be into this RUNTS or we can avoid it. In the latter case, our Society will not change. If we have to, we will be forced to change our statute and the policy of this RUNTS concerns problems about VAT and so forth. This will imply the fact that before the 31st of December 2023 we have to understand whether the statute requires to be modified. We hope to give you more information during the assembly.

What is it going to happen next year? First of all, the 2nd Congress of the Geochemical Society is expected to be organized. During the General Assembly, there will be presented the new candidate city. It is likely that early July will be the period when the congress is going to be occurring. Then, other events such as the Granulite&Granulite Conference, the geochemistry of mercury (as element), the background values of soils, sediments and waters, the classical International School of Volcanic fluids, the 3rd edition of the Isotopic Ratio Day, and so forth are expected to happen thanks to the collaboration and dedication of our members.

I do wish to conclude this short letter with two great thanks. I do want to thank Caterina Gozzi for the new episodes about "R". I had several positive feedback about these "lectures" and I do really hope that Caterina will keep going on with this interesting chapters! Many thanks to Jacopo Cabassi for his valuable contribution with a detailed list of the papers produced by our community. We are now 154 members and Jacopo's efforts have increased since 2020 when we had this list of articles published by our members. As I highlighted in the previous newsletter, this list is a sort of (geochem)thermometer of the productivity of our community. It has no value but it allows to evidence the importance of our discipline and the



transversality that Geochemistry has, being able to be used in many field of Earth and other sciences.

The last but not the least...Giulio Ottonello has been elected as Corresponding Member of the

Accademia Nazionale dei Lincei (see enclosed letter). During the opening ceremony of the Academic Year 2023-2024 of the Lincei (November 10, 2023), Giulio Ottonello will be awarded by the Accademia. In the

name of our Society I do wish express our felicitations to Giulio for this new important achievement.

Accademia dei Lincei - Protocollo N. 0002240 - U - del 26/07/2023



ACCADEMIA NAZIONALE DEI LINCEI

IL PRESIDENTE

Prof. Giulio Armando Ottonello
DISTAV Università di Genova
Corso Europa 26
16132 Genova
giottomail49@gmail.com

Illustre Prof. Ottonello,

nel comunicarLe la notizia della Sua elezione a Socio Corrispondente dell'Accademia dei Lincei - C. di Scienze Fisiche, Matematiche e Naturali (Cat. IV Geoscienze), Le esprimo le più sentite felicitazioni con la convinzione che Lei apporterà ai Lincei un ulteriore contributo di scienza e cultura.

Ho il piacere di informarLa che la Cerimonia di apertura dell'anno accademico dei Lincei 2023-2024 si terrà il prossimo 10 novembre; in quella occasione saranno consegnati i distintivi ai nuovi Soci eletti.

La segreteria dell'Accademia nelle persone della dott.ssa Ilaria Bonincontro (ilaria.bonincontro@lincei.it), del dott. Stephen Fox (stephen.fox@lincei.it) e del dott. Stefano Bragato (stefano.bragato@lincei.it) si metterà al più presto in contatto con Lei per tutti i dettagli organizzativi e amministrativi.

Con rinnovati rallegramenti e molti cordiali saluti.

Roberto Antonelli

(Roberto Antonelli)

Via della Lungara, 10 - 00165 Roma Telefono (+39) 06 6868223 / 06 6861159
posta elettronica roberto.antonelli@lincei.it Sito web www.lincei.it



Members' Activities

Vulcano Summer School 2023: “Sampling and Measuring Techniques of Volcanic Fluids: Science meets Practice”

Stefania Venturi

The **Vulcano Summer School 2023**, titled “**Sampling and Measuring Techniques of Volcanic Fluids: Science meets Practice**”, was held in Vulcano Island (Aeolian Archipelago, Italy) from the 19th to the 23rd of June 2023. It was the third edition of the summer school patronized by **So.Ge.I.** and sponsored by **Thearen** and **SRA Instruments Analytical Solutions**.

The school was addressed to **Master and PhD students** and **PostDoc researchers** and gathered researchers and professors with diverse expertise in fluid geochemistry, biogeochemistry and microbiology, atmospheric chemistry, volcanology and hydrogeochemistry.

This year, attendance was impressive: **78 students** (from Chile, Germany, Italy, Romania and UK) and **33 teachers** from (Germany, Italy, Romania and Switzerland)!!

The school started with the traditional **ice-breaker** on June 19 with an introduction to the school and the planned activities and the delivery of the official t-shirt, sipping a beer before enjoying the sunset on the Ponente beach.

In the next days, the students had the opportunity to experience, directly in the field, different sampling and measuring techniques devoted to volcanic surveillance and monitoring, environmental quality assessment and understanding of deep and shallow geobiochemical processes, including (i) **air quality measurements**, (ii) **water sampling**, (iii) **diffuse soil flux measurements**, **soil gas sampling**, **microbiological investigations**, (iv) **bubbling and fumarolic gas (including submerged outlets) sampling**, (v) **multigas measurements**, (vi) **remote sensing**.

Field activities were performed both in the inhabited area of Vulcano Porto, including the hydrothermal area of Baia di Levante, and at La Fossa Crater.

The last evening, a **pizza social dinner** was held at Il Castello Restaurant after the **Certificate Ceremony**. The evening ended with the “**Volcanic party**” with dj set.



See you next year!!!





Members' Activities

4th CAMGEO School: “Sampling and Analysis of Geological Matrices”

Barbara Nisi and Orlando Vaselli

From the 11th to the 14th of July, 2023, after many difficulties mostly related to the sanitary emergency the CAMGEO (*Sampling and Analysis of Geological Matrices*) has had its 4th Edition. The School was held at Abbadia San Salvatore (Siena, Tuscany) in the beautiful landscape of Mt. Amiata. The School was organized by Barbara Nisi, Daniele Rappuoli (Director of the locam Mining Park Museum), Orlando Vaselli and Marino Zuccolini. PhD students and young researchers participated to the this event and numerous teachers from universities and research centers (INGV and CNR) intervened on the main focus of this school: *Conventional and not conventional isotopes applied to the environment*.

The program of this school was including different aspects of isotope geochemistry. From the classical (e.g. oxygen, hydrogen, carbon and nitrogen) to not conventional (e.g. chromium, mercury, tritium) isotopes. As usual, the very first part of the school was introductory and referred to the sampling and analysis of waters, soils and stream sediments. Before the lectures, the major of Abbadia San Salvatore (Fabrizio Tondi) and the Director of the Mining Park Museum (Daniele Rappuoli) greeted the participants and the teachers. Half-day of the school was dedicated to field-work which was carried out at Pietrineri where a significant release of CO₂ from vents and fractures and diffuse soil is occurring. Here, the students could experience how to sample a free-gas and a water. Additionally, a new technique for measuring diffuse CO₂ and Hg soil and flux was shown thanks to the support of Giorgio Virgili (Thearen).

As organizers of this event, we were satisfied of the success that the School had. The only negative remark was

the accommodation since it was not respecting the expectations we had. At the beginning of the next year, it will high time to think about the next location and topics for the forthcoming 2025 edition of CAMGEO.





Members' Activities

First National Italian Workshop on Fluid and melt Inclusions

Francesco Maria Lo Forte

Primo Workshop Nazionale
sulle inclusioni fluide e vetrose



Palermo, Orto Botanico
10-11 Maggio 2023

The "First National Italian Workshop on Fluid and Melt Inclusions" took place at the Botanical Garden of Palermo, Sicily, Italy on May 10th-11th, 2023. The Department of Earth and Marine Sciences at the University of Palermo organized the event, receiving significant financial support and sponsorship from several organizations such as the Italian Society of Mineralogy and Petrography (SIMP), the Italian Association of Volcanology (AIV), the Italian Geochemical Society (So.Ge.I.), the Italian Gemological Review (IGR), and the Petrolab laboratory, which also acted as media partners and sponsors. The workshop attracted a diverse range of participants, including researchers, PhD, master's, and bachelor's students, as well as interested individuals from both national and international universities and research institutions. Notable institutions in attendance included the Universities of Catania, Chieti-Pescara, Florence, La Sapienza (Rome), Bicocca (Milan), Federico II (Naples), Palermo, Pavia, Potenza, and Vienna, as well as the National Research Council (IGG-CNR) and the National Institute of Geophysics and Volcanology (INGV). The workshop's main objective was to explore the identification, characterization, and application of fluid and melt inclusions in the field of Earth Sciences. Additionally, it aimed to foster communication between academic researchers, young researchers, and the national and international business community. The peculiarity of the workshop was the integration of gemmologists who approached the study of fluid and melt inclusions from a commercial standpoint, bridging the gap between academia and industry. Spanning two days, the workshop comprised four thematic sessions, each led by

keynote speeches provided by experts in the field. Following the keynotes, participants had the opportunity to present their research through oral presentations.

Day 1:

Theme 01: "Fluid inclusions, tracers of petrological and geodynamic processes".

Keynote: **Maria Luce Frezzotti** (University of Milan Bicocca): "Carbon fluxes in the lithospheric mantle recorded by fluid inclusions" and **Andrea Rizzo** (INGV section of Milano): "Noble gases isotopes in fluid inclusions: methods and applications to Geosciences".

Oral speakers: **Federica Benedetti** (University of Rome La Sapienza), **Federico Casetta** (University of Vienna), **Gabriele Carnevale** (University of Palermo), **Laura Italiano** (INGV section of Palermo), **Giulia Marras** (University of Rome La Sapienza), and **Andrés Libardo Sandoval Velasquez** (University of Palermo).

Theme 02: "Resources and reserves, fluid inclusions as a survey method for prospecting".

Keynote: **Giovanni Ruggieri** (National Research Council, IGG-CNR): "Application of the synthetic fluid inclusion method for temperature measurements in super hot geothermal reservoirs".

Oral speakers: **Evelina Dallara** (University of Pisa)



Day 2:

Theme 03: "The glassy inclusions, tracers of deep and superficial magmatic processes".

Keynote: **Rosario Esposito** (University of Milan Bicocca): "Selecting melt inclusions associated to volcanic systems and interpreting their volatile records: an integrated approach".

Oral speakers: **Emanuela Gennaro** (University of Chieti-Pescara), **Francesco Maria Lo Forte** (University of Palermo), **Anna Maria Lima** (University of Naples, Federico II), **Bruna Cariddi** (INGV section of Napoli), and **Simone Costa** (University of Pisa).

Theme 04: "Fluid inclusions in materials of gemological interest".

Keynote **Maya Musa** (University of Milan Bicocca, present address: University of Pavia): "Fluid inclusions in gemstones: which information can provide for gem lab applications?".

Oral speakers: **Francesco Protopapas** (Affide, pawnbroker company).





R-Corner

Caterina Gozzi

Fitting distributions: R package "fitdistrplus"

Fitting distributions to data represent a very common task in geochemistry. It consists of choosing a probability distribution which most accurately models the investigated geochemical variable. Understanding the shape of the distributions might represent a powerful and often overlooked tool to understand the dynamics of a given system (van Rooij et al. 2013). Geochemical systems are not an exception, and the distributional analysis of concentration values may inform about mechanisms governing data variability (Buccianti et al. 2018).

In this R corner we present a brief overview of some functions available in the R package *fitdistrplus* (Delignette-Muller et al. 2014) which provide and implement several methods for fitting univariate parametric distributions to censored or non-censored data (<https://cran.r-project.org/package=fitdistrplus>). The idea of this package emerged in 2008 from a collaboration between J.B. Denis, R. Pouillot and M.L. Delignette who at that time worked in quantitative risk assessment. The stable version of "fitdistrplus" can be installed from CRAN using: `install.packages("fitdistrplus")`.

The main function for fitting non-censored data distributions is `fitdistr`, in which different methods can be chosen to estimate the distribution parameter:

- maximum likelihood estimation by default (`mledist`),
- moment matching estimation (`mmedist`),
- quantile matching estimation (`qmedist`),
- maximum goodness-of-fit estimation (`mgedist`).

The choice of candidate distributions to fit may be helped by using the functions `descdist` and `plotdistr`. Additionally, the goodness-of-fit of fitted distributions (a single fit or multiple fits) can be explored using different graphical functions. These functions, grouped under the name "graphcomp", enable to perform a graphical comparison of multiple fitted distributions, thereby facilitating the choice of the best fitting.

An example of application is illustrated in Figures 1-4 by considering HCO_3^- concentrations (in mg/L) measured in Eastern Siberian rivers (Liu et al., 2022). The corresponding R code for generating the plots is reported below the Figures 1-4. In the present example three possible distributions were fitted using the function `fitdistr(data, distr)`, where `data` is a numeric vector and `distr` a character string naming a distribution type, e.g., "norm", "gamma" and "lnorm" for normal, gamma and lognormal distribution, respectively. However, several other distributions are available in the package including the pareto (heavy-tailed) distribution. The function `summary(fitname)` provides the parameter estimates of each fitted distribution along with standard errors and correlation matrix of parameter estimates. The fitted distributions can then be compared using the "graphcomp" functions which are as follows:

- `cdfcomp` plots the empirical cumulative distribution against fitted distribution functions (Fig.1),
- `denscomp` plots the histogram against fitted density functions (Fig.2),
- `qqcomp` plots theoretical quantiles against empirical ones (Fig.3),
- `ppcomp` plots theoretical probabilities against empirical ones (Fig.4).

```
library(fitdistrplus)
var <- data$HCO3

fitN <- fitdistr(var, "norm")
fitG <- fitdistr(var, "gamma")
fitLN <- fitdistr(var, "lnorm")

summary(fitN)
summary(fitG)
summary(fitLN)

cdfcomp(list(fitN, fitG, fitLN), legendtext=c("normal", "gamma", "lognormal"))
denscomp(list(fitN, fitG, fitLN), legendtext=c("normal", "gamma", "lognormal"))
qqcomp(list(fitN, fitG, fitLN), legendtext=c("normal", "gamma", "lognormal"))
ppcomp(list(fitN, fitG, fitLN), legendtext=c("normal", "gamma", "lognormal"))
gofstat(list(fitN, fitG, fitLN), fitnames=c("normal", "gamma", "lognormal"))
```

#1
#2
#3
#4

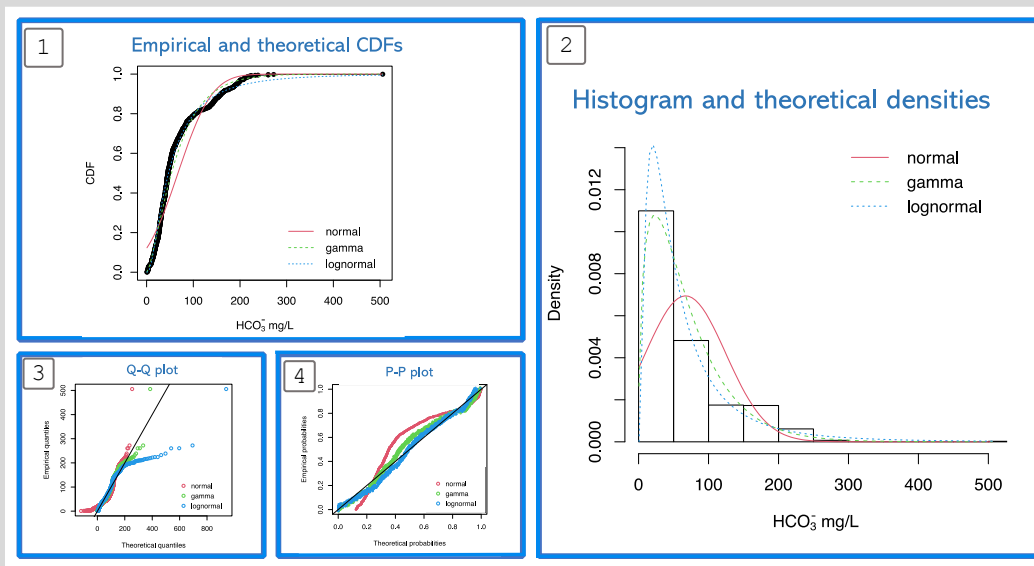
Scaricare e installare R e RStudio



R è un software completamente gratuito che può essere utilizzato su sistemi operativi Linux, Windows e Mac. Visita <https://www.r-project.org> e segui le istruzioni per scaricare la versione di R compatibile con il tuo sistema. L'ultima versione (R 4.0.3, Bunny-Wunnies Freak Out) è stata rilasciata in data 10-10-2020.



R Studio fornisce un ambiente integrato per R con numerose funzionalità per migliorare l'esperienza dell'utente e rendere più semplice l'utilizzo di R. Dopo aver installato R, è possibile scaricare e installare gratuitamente RStudio dal sito <http://www.rstudio.com/>. L'ultima versione (RStudio Desktop 1.3.1093) è stata rilasciata in data 18-10-2020.



Goodness-of-fit statistics are also provided through the function `gofstat`. The density plot (Fig.1) and the CDF plot (Fig.2) may be considered as the basic classical goodness-of-fit plots. The observation of the empirical distribution with theoretical densities and CDFs shows that HCO_3^- distribution seems to be better described by a gamma or a lognormal distribution. The two other plots are complementary and can be very informative in some cases. The Q-Q plot emphasizes the lack-of-fit at the distribution tails (Fig.3) while the P-P plot (Fig. 4) emphasizes the lack-of-fit at the distribution center (Delignette-Muller et al. 2014).

In the example, none of the three fitted distributions seem to correctly describe the right tail of the empirical distribution, but the lognormal could be preferred for its better description of the center of the distribution. The lognormal distribution is the fundamental natural law at the base of the partition and dilution processes of elements and chemical species in different geological matrices (Limpert et al., 2001). However, the lack-of-fit at the right distribution tail could suggest a possible role of the power-law distribution in explaining the presence of a heavy tail (Agterberg, 2007). For further details on the presented and additional functions it is recommended to refer to the following guide to the *fitdistrplus* package https://cran.r-project.org/web/packages/fitdistrplus/vignettes/fitdistrplus_vignette.html.

References

- Agterberg F.P. (2007). Mixtures of multiplicative cascade models in geo-chemistry. *Nonlinear Process Geophys* 14:201–209.
- Buccianti A., Lima A., Albanese S., De Vivo B. (2018) Measuring change under compositional data analysis (CoDA): insight on the dynamics of geochemical systems. *J. Geochem. Explor.* 189:100–108.
- Delignette-Muller M.L., Dutang C. (2015). “fitdistrplus: An R Package for Fitting Distributions.” *Journal of Statistical Software*, 64(4), 1–34. doi:10.18637/jss.v064.i04.
- Limpert E., Stahel W.A., Abbt M. (2001). Log-normal distributions cross the sciences: keys and clues. *Bioscience* 51(5):341–352.
- Liu, S., Wang, P., Huang, Q., Gabysheva, O., Li, Z., Zhang, J., Kazak, E., Liu, Y., Bazarzhapov, T., Shpakova, R., Gabyshev, V., Pozdniakov, S., Frolova, N., (2022). A database of water chemistry in eastern Siberian rivers. *Scientific Data* 9(737), 1–11. doi:10.1038/s41597-022-01844-y
- van Rooij, M., Nash, B., Rajaraman, S., Holden, J., (2013) A fractal approach to dynamic inference and distribution analysis. *Frontiers in Physiology* 4(1), 1–11.

Events and Opportunities



Special Issues

▶ *Geochemistry and Mineralogy of Clays and Their Application to Paleoclimatic and Paleoenvironmental Reconstruction*

Minerals (IF 2.818)

[Website](#)

Deadline for manuscript submissions: **30 November 2023**



▶ *Multi-element Geochemical Mapping in South and Central Asia at National Scale*

Journal of Geochemical Exploration (IF 4.166)

[Website](#)

Deadline for manuscript submissions: **31 October 2023**



Follow So.Ge.I. on Social Media



<https://twitter.com/SocietaGe>



<https://www.facebook.com/Società-Geochimica-Italiana-105767361597947>



https://instagram.com/societageochimica_it



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

Events and Opportunities



Conferences and Congresses

- ▶ **SIMP, SGI, SOGEI, AIV Joint Congress**
The Geoscience paradigm: Resources, Risks and future perspectives
Potenza (Italy), 19-21 September 2023
[Website](#)
Early Registration deadline: **21 June 2023**
Online Registration deadline: **9 September 2023**

- ▶ **BeGEO2023**
Sustainability and Risk: BeGEO Scientists on the road to the future
Naples (Italy), 3-6 October 2023
[Website](#)
Abstract submission deadline: **1 June 2023**
Early Registration deadline: **31 July 2023**

- ▶ **GeothermiX**
How Earth's heat is studied and impacts society
Pisa (Italy), 29 November-1 December 2023
Details will be provided as soon as possible on the So.Ge.I. website



Members' Publications

List of Members' Publications (IF_≥2)

referred to the period Apr 22, 2023 – Aug 21, 2023

- Ahmadnejad, F. & **Mongelli, G.** (2023). Geochemistry of Upper Cretaceous bauxite deposits, Zagros Fold Thrust Belt, SW Iran: Paleoenvironment and provenance constraints. *Sedimentary Geology*, 454. <https://doi.org/10.1016/j.sedgeo.2023.106461>
- Aiuppa, A.**, Lo Bue Trisciuzzi, G., Alparone, S., Bitetto, M., Coltelli, M., Delle Donne, D., Ganci, G., & Pecora, E. (2023). A SO₂ flux study of the Etna volcano 2020–2021 paroxysmal sequences. *Frontiers in Earth Science*, 11. <https://doi.org/10.3389/feart.2023.1115111>
- Albanese, S.**, Ebrahimi, P., Aruta, A., **Cicchella, D.**, De Vivo, B. & Lima, A. (2023). Potentially toxic elements in the soils of Campi Flegrei (south Italy) and the immediate surroundings: Spatial distribution, origin and probabilistic human health risk. *Chemosphere*, 313. <https://doi.org/10.1016/j.chemosphere.2022.137297>
- Ambrosino, M.**, El-Saadani, Z., Khatita, A. A., Mingqi, W., Palarea-Albaladejo, J. & **Cicchella, D.** (2023). Geochemical Speciation, Ecological Risk and Assessment of Main Sources of Potentially Toxic Elements (PTEs) in Stream Sediments from Nile River in Egypt. *Water (Switzerland)*, 15(13). <https://doi.org/10.3390/w15132308>
- Apollaro, C.**, **Fuoco, I.**, Gennaro, E., Giuliani, L., Iezzi, G., Marini, L., Radica, F., Di Luccio, F., Ventura, G. & **Vespasiano, G.** (2023). Advanced argillic alteration at Cave di Caolino, Lipari, Aeolian Islands (Italy): Implications for the mitigation of volcanic risks and the exploitation of geothermal resources. *Science of the Total Environment*, 889. <https://doi.org/10.1016/j.scitotenv.2023.164333>
- Aravena, A., Bevilacqua, A., Neri, A., Gabellini, P., Ferrés, D., Escobar, D., **Aiuppa, A.** & Cioni, R. (2023). Scenario-based probabilistic hazard assessment for explosive events at the San Salvador volcanic complex, El Salvador. *Journal of Volcanology and Geothermal Research*, 438. <https://doi.org/10.1016/j.jvolgeores.2023.107809>
- Aruta, A., **Albanese, S.**, Daniele, L., Cannatelli, C., Buscher, J. T., De Vivo, B., Petrik, A., **Cicchella, D.** & Lima, A. (2023). A new approach to assess the degree of contamination and determine sources and risks related to PTEs in an urban environment: the case study of Santiago (Chile). *Environmental Geochemistry and Health*, 45(2), 275–297. <https://doi.org/10.1007/s10653-021-01185-6>
- Barago, N.**, Mastroianni, C., **Pavoni, E.**, **Floreani, F.**, Parisi, F., Lenaz, D. & **Covelli, S.** (2023). Environmental impact of potentially toxic elements on soils, sediments, waters, and air nearby an abandoned Hg-rich fahlore mine (Mt. Avanza, Carnic Alps, NE Italy). *Environmental Science and Pollution Research*, 30(23), 63754–63775. <https://doi.org/10.1007/s11356-023-26629-7>
- Barago, N.**, **Pavoni, E.**, **Floreani, F.**, Crosera, M., Adami, G., Lenaz, D. & **Covelli, S.** (2023). Hydrogeochemistry of thallium and other potentially toxic elements in neutral mine drainage at the decommissioned Pb-Zn Raibl mine (Eastern Alps, Italy). *Journal of Geochemical Exploration*, 245. <https://doi.org/10.1016/j.gexplo.2022.107129>
- Barbieri, M.** (2023). Editorial: Groundwater salinity: origin, impact, and potential remedial measures and management solutions. *Frontiers in Water*, 5. <https://doi.org/10.3389/frwa.2023.1202576>
- Bardelli, F., Giacobbe, C., Ballirano, P., Borelli, V., Di Benedetto, F., **Montegrossi, G.**, Bellis, D. & Pacella, A. (2023). Closing the knowledge gap on the composition of the asbestos bodies. *Environmental Geochemistry and Health*, 45(7), 5039–5051. <https://doi.org/10.1007/s10653-023-01557-0>
- Bekaert, D. V., Barry, P. H., Broadley, M. W., Byrne, D. J., Marty, B., Ramírez, C. J., de Moor, J. M., Rodriguez, A., Hudak, M. R., Subhas, A. V., Halldorsson, S.A., Stefansson, A., **Caracausi, A.**, Lloyd, K.G., Giovannelli, D. & Seltzer, A.M. (2023). Ultrahigh-precision noble gas isotope analyses reveal pervasive subsurface fractionation in hydrothermal systems. *Science Advances*, 9(15). <https://doi.org/10.1126/sciadv.adg2566>
- Biralvand, M., Ballato, P., Balestrieri, M. L., Mohajjel, M., Sobel, E. R., Dunkl, I., **Montegrossi, G.**, Ghassemi, M. R., Glodny, J. & Strecker, M.R. (2023). Low-Temperature Thermochronologic Response to Magmatic Reheating: Insights From the Takab Metallogenic District of NW Iran, (Arabia-Eurasia Collision Zone). *Geochemistry, Geophysics, Geosystems*, 24(1). <https://doi.org/10.1029/2022GC010561>
- Black, B. A. & **Aiuppa, A.** (2023). Carbon release from Large Igneous Province magmas estimated from trace element-gas correlations. *Volcanica*, 6(1), 129–145. <https://doi.org/10.30909/vol.06.01.129145>
- Bonini, M., Biccocchi, G., Montanari, D., Ruggieri, G., **Tassi, F.**, **Capecchiacci, F.**, **Vaselli, O.**, Sani, F. & Maestrelli, D. (2023). Small-magnitude earthquakes triggering fluid vents in a pressurised CO₂ system, Caprese Michelangelo (Central Italy). *Tectonophysics*, 847. <https://doi.org/10.1016/j.tecto.2022.229693>
- Bonnet, S., Guieu, C., Taillandier, V., Boulart, C., Bouruet-Aubertot, P., Gazeau, F., Scalabrin, C., Bressac, M., Knapp, A. N., Cuyppers, Y., Gonzales-Santana, D., Forrer, H.J., Grosso, O., Habasque, J., Jardin-Camps, M., Leblond, N., Le Moigne, F.A.C., Lebourges-Dhaussy, A., Lory, C., Pulido-Villena, E., **Rizzo, A.L.**, Sarthou, G. & Tilliette, C. (2023). Natural iron fertilization by shallow hydrothermal sources fuels diazotroph blooms in the ocean. *Science*, 380(6647), 812–817. <https://doi.org/10.1126/science.abq4654>
- Borghini, G., Fumagalli, P., Arrigoni, F., Rampone, E., Berndt, J., Klemme, S. & **Tiepolo, M.** (2023). Fast REE re-distribution in mantle clinopyroxene via reactive melt infiltration. *Geochemical Perspectives Letters*, 26, 40–44. <https://doi.org/10.7185/geochemlet.2323>



Members' Publications

- Bouidoire, G., Padeloup, G., Schiavi, F., Cluzel, N., Rafflin, V., Grassa, F., Giuffrida, G., Liuzzo, M., Harris, A., Laporte, D. & **Rizzo, A.L.** (2023). Magma storage and degassing beneath the youngest volcanoes of the Massif Central (France): Lessons for the monitoring of a dormant volcanic province. *Chemical Geology*, 634. <https://doi.org/10.1016/j.chemgeo.2023.121603>
- Bragagni, A., **Braschi, E.**, Orlando, A., Guarnieri, L., Corti, G. & Tommasini, S. (2023). Time-space variations in the East African Rift magmatism: the role of different mantle domains. *Italian Journal of Geosciences*, 142(1), 83–101. <https://doi.org/10.3301/IJG.2023.08>
- Broggi, A., Regoli, R., Spina, A., Capezzuoli, E., **Zucchi, M.**, Lucci, F., Caggianelli, A., Ventruti, G., Sorci, A., Aldinucci, M. & Cirilli, S. (2023). The Permian-Triassic succession of the Montagnola Senese Ridge (Middle Tuscan Ridge, Italy): a perspective for late Palaeozoic magmatism and continentalisation in the western Tethys. *International Geology Review*. <https://doi.org/10.1080/00206814.2023.2220011>
- Brugnone, F.**, **D'Alessandro, W.**, Parello, F., Brusca, L., Saiano, F., **Li Vigni, L.**, Sprovieri, M. & **Calabrese, S.** (2023). Atmospheric Deposition around the Industrial Areas of Milazzo and Priolo Gargallo (Sicily–Italy)—Part B: Trace Elements. *Atmosphere*, 14(4). <https://doi.org/10.3390/atmos14040737>
- Buono, G., **Caliro, S.**, Macedonio, G., Allocca, V., Gamba, F. & Pappalardo, L. (2023). Exploring microstructure and petrophysical properties of microporous volcanic rocks through 3D multiscale and super-resolution imaging. *Scientific Reports*, 13(1). <https://doi.org/10.1038/s41598-023-33687-x>
- Buttitta, D.**, Capasso, G., **Paternoster, M.**, Barberio, M. D., Gori, F., Petitta, M., Picozzi, M. & **Caracausi, A.** (2023). Regulation of deep carbon degassing by gas-rock-water interactions in a seismic region of Southern Italy. *Science of the Total Environment*, 897. <https://doi.org/10.1016/j.scitotenv.2023.165367>
- Cannaò, E.**, Milani, S., Merlini, M., **Tiepolo, M.** & Fumagalli, P. (2023). Phase-A as boron carrier in the Earth's interior. *Lithos*, 452–453. <https://doi.org/10.1016/j.lithos.2023.107211>
- Cannaò, E.**, Scambelluri, M., Müntener, O., Putlitz, B. & Agostini, S. (2023). Inheritance versus subduction-related $\delta^{11}\text{B}$ signatures of eclogites: Insights from the Voltri Massif (Ligurian Western Alps, Italy). *Chemical Geology*, 615. <https://doi.org/10.1016/j.chemgeo.2022.121218>
- Caracausi, A.**, Camarda, M., Chiaraluce, L., De Gregorio, S., Favara, R. & Pisciotta, A. (2023). A novel infrastructure for the continuous monitoring of soil CO₂ emissions: a case study at the alto Tiberina near fault observatory in Italy. *Frontiers in Earth Science*, 11. <https://doi.org/10.3389/feart.2023.1172643>
- Carapezza, M. L.**, Tarchini, L., Ancona, C., Forastiere, F., Ranaldi, M., Ricci, T., De Simone, G., Mataloni, F., Pagliuca, N. M. & Barberi, F. (2023). Health impact of natural gas emission at Cava dei Selci residential zone (metropolitan city of Rome, Italy). *Environmental Geochemistry and Health*, 45(3), 707–729. <https://doi.org/10.1007/s10653-022-01244-6>
- Carli, C., Barbaro, A., Murri, M., Domeneghetti, M. C., **Langone, A.**, Bruschini, E., Stephant, A., Alvaro, M., Stefani, S., Cuppone, T., Roush, T.L. & Pratesi, G. (2023). Al Huwaysah 010: The most reduced brachinite, so far. *Meteoritics and Planetary Science*, 58(6), 855–874. <https://doi.org/10.1111/maps.13998>
- Casetta, F.**, Asenbaum, R., Ashchepkov, I., Abart, R. & Ntaflou, T. (2023). Mantle-Derived Cargo vs Liquid Line of Descent: Reconstructing the P-T-fO₂-X Path of the Udachnaya-East Kimberlite Melts during Ascent in the Siberian Sub-Cratonic Lithosphere. *Journal of Petrology*, 64(1). <https://doi.org/10.1093/petrology/egac122>
- Casetta, F.**, Asenbaum, R., Ashchepkov, I., Ageeva, O., Abart, R. & Ntaflou, T. (2023). Ascent rate of the Udachnaya-East kimberlite melts from olivine diffusion chronometry. *Earth and Planetary Science Letters*, 619. <https://doi.org/10.1016/j.epsl.2023.118322>
- Cegolon, L., Petranich, E., **Pavoni, E.**, **Floreni, F.**, **Barago, N.**, Papassissa, E., Larese Filon, F. & **Covelli, S.** (2023). Concentration of mercury in human hair and associated factors in residents of the Gulf of Trieste (North-Eastern Italy). *Environmental Science and Pollution Research*, 30(8), 21425–21437. <https://doi.org/10.1007/s11356-022-23384-z>
- Chen, Y., Rich, D. Q., **Masiol, M.** & Hopke, P.K. (2023). Changes in ambient air pollutants in New York State from 2005 to 2019: Effects of policy implementations and economic and technological changes. *Atmospheric Environment*, 311. <https://doi.org/10.1016/j.atmosenv.2023.119996>
- Chimenti, M., **Natali, S.**, Giannecchini, R., **Zanchetta, G.**, **Baneschi, I.**, Doveri, M., Isola, I. & Piccini, L. (2023). Hydrogeochemistry and Isotopic Composition of Waters in the Renella Cave (Central Italy): New Insights into Groundwater Dynamics. *Water (Switzerland)*, 15(9). <https://doi.org/10.3390/w15091764>
- Cipriani, M., Dominici, R., Costanzo, A., **Vespasiano, G.**, **Apollaro, C.**, Miriello, D., Cianflone, G., Perri, F., D'Antonio, M., Maruca, G., Maruca, G. & Guido, A. (2023). Messinian resedimented gypsum (branching-like facies) from the Catanzaro Basin (Calabria, Southern Italy): petrographic and geochemical evidence for paleoenvironmental reconstruction. *Rendiconti Online Società Geologica Italiana*, 59, 35–39. <https://doi.org/10.3301/ROL.2023.06>
- Clason, C. C., **Baccolo, G.**, Łokas, E., Owens, P. N., Wachniew, P., Millward, G. E., Taylor, A., Blake, W. H., Beard, D. B., Poniecka, E., Ambrosini, R. & Di Mauro, B. (2023). Global variability and controls on the accumulation of fallout radionuclides in cryoconite. *Science of the Total Environment*, 894. <https://doi.org/10.1016/j.scitotenv.2023.164902>
- Corli, A., Gerdol, R., Orsenigo, S., Rossi, G., Abeli, T., **Iacumin, P.**, Marchesini, R. & Brancaloni, L. (2023). Relative importance of site selection and aftercare for successful reintroduction of the policy species *Kosteletzkya pentacarpos*. *Plant Biosystems*, 157(1), 80–88. <https://doi.org/10.1080/11263504.2022.2089762>



Members' Publications

- Dallara, E., Fulignati, P.,** Costa, S., Gioncada, A., **Langone, A.** & Pistolesi, M. (2023). Apatite chemistry in shoshonitic magmas: Insights into the volatile evolution at La Fossa volcano (Vulcano Island, Aeolian Arc, Italy). *Lithos*, 454–455. <https://doi.org/10.1016/j.lithos.2023.107238>
- Deias, C., Guido, A., Sanfilippo, R., **Apollaro, C.,** Dominici, R., Cipriani, M., Barca, D. & **Vespasiano, G.** (2023). Elemental Fractionation in Sabellariidae (Polychaeta) Biocement and Comparison with Seawater Pattern: A New Environmental Proxy in a High-Biodiversity Ecosystem? *Water (Switzerland)*, 15(8). <https://doi.org/10.3390/w15081549>
- Del Gaudio, P., Misiti, V., **Cantucci, B., Liotta, M.,** Ventura, G., Ricci, T., **Sciarra, A.,** Di Naccio, D., Amoroso, S. & Monaco, P. (2023). Multidisciplinary Study of Mud Emissions Following the 2016 Norcia Earthquake. *Applied Sciences (Switzerland)*, 13(12). <https://doi.org/10.3390/app13126968>
- Della Porta, G., **Mancini, A.** & Berra, F. (2023). Facies character and evolution of a mixed carbonate–siliciclastic shelf: Upper Triassic–Lower Jurassic succession in the eastern Northern Calcareous Alps (Stumpfmauer, Austria). *Facies*, 69(3). <https://doi.org/10.1007/s10347-023-00662-x>
- Donnini, M.,** Santangelo, M., Gariano, S. L., Bucci, F., Peruccacci, S., Alvioli, M., Althuwaynee, O., Ardizzone, F., Bianchi, C., Bornaetxea, T., Yazdani, M. & Fiorucci, F. (2023). Landslides triggered by an extraordinary rainfall event in Central Italy on September 15, 2022. *Landslides*. <https://doi.org/10.1007/s10346-023-02109-4>
- Ercoli, L., **Rossetto, R.,** Di Giorgi, S., Raffaelli, A., Nuti, M. & Pellegrino, E. (2023). Effective bioremediation of clarithromycin and diclofenac in wastewater by microbes and Arundo donax L. *Environmental Science and Pollution Research*, 30(31), 77193–77209. <https://doi.org/10.1007/s11356-023-27660-4>
- Falcone, F., Di Valerio, E., La Salvia, V., **Rosatelli, G.,** Perna, M. G., Bello, S., Francis, R. E. & Stoppa, F. (2023). Geo-archaeology, archaeometry, and history of a seismic-endangered historical site in central Apennines (Italy). *Heritage Science*, 11(1). <https://doi.org/10.1186/s40494-023-00906-7>
- Fancello, D., **Dore, E.,** Medas, D., Rigonat, N., Meneghini, C., Moroni, M., Naitza, S., Onnis, P. & De Giudici, G. (2023). Antimony contamination sources and alteration pathways of Sb mineral phases in an abandoned mining area: The role of secondary mopingite [NaSb(OH)₆]. *Applied Geochemistry*, 156. <https://doi.org/10.1016/j.apgeochem.2023.105764>
- Fastelli, M., Schmitt, B., Beck, P., Poch, O., **Zucchini, A., Frondini, F.** & Comodi, P. (2023). Reflectance spectra of mascagnite and salammoniac minerals with varying viewing geometry. *Icarus*, 403. <https://doi.org/10.1016/j.icarus.2023.115633>
- Fernandez, G., Giaccio, B., Monaco, L., Tomatis, M., Pacella, A., Palladino, D. M., Sulpizio, R., Turci, F., **Zanchetta, G.,** Ballirano, P. & Sottili, G. (2023). Physical and chemical characterization of the Pomici di Avellino ashes (3.9 ka) from Somma-Vesuvius volcano for future health hazard assessment. *Journal of Volcanology and Geothermal Research*, 438. <https://doi.org/10.1016/j.jvolgeores.2023.107826>
- Floreani, F., Barago, N.,** Klun, K., Faganeli, J. & **Covelli, S.** (2023). Dissolved gaseous mercury production and sea-air gaseous exchange in impacted coastal environments of the northern Adriatic Sea. *Environmental Pollution*, 332. <https://doi.org/10.1016/j.envpol.2023.121926>
- Floreani, F., Pavoni, E.,** Gosar, M. & **Covelli, S.** (2023). Evasion of Gaseous Elemental Mercury from Forest and Urban Soils Contaminated by Historical and Modern Ore Roasting Processes (Idrija, Slovenia). *Atmosphere*, 14(6). <https://doi.org/10.3390/atmos14061036>
- Floreani, F.,** Zappella, V., Faganeli, J. & **Covelli, S.** (2023). Gaseous mercury evasion from bare and grass-covered soils contaminated by mining and ore roasting (Isonzo River alluvial plain, Northeastern Italy). *Environmental Pollution*, 318. <https://doi.org/10.1016/j.envpol.2022.120921>
- Fulignati, P.,** & Boyce, A.J. (2023). Stable Isotope ($\delta^{18}\text{O}$, δD) Composition of Magmatic Fluids Exsolved from an Active Alkaline Magma Chamber—The Case of the AD 79 Magma Chamber of Vesuvius. *Minerals*, 13(7). <https://doi.org/10.3390/min13070913>
- Funari, V., **Toller, S.,** Vitale, L., Santos, R. M. & Gomes, H. I. (2023). Urban mining of municipal solid waste incineration (MSWI) residues with emphasis on bioleaching technologies: a critical review. *Environmental Science and Pollution Research*, 30(21), 59128–59150. <https://doi.org/10.1007/s11356-023-26790-z>
- Garofalo, P.S.,** Scarsi, M., Gundlach-Graham, A., Schwarz, G. & Günther, D. (2023). Feedbacks between fast brittle faulting, hydrothermal fluid flow, and metal transport within carbonated ultramafics (Ligurian Western Alps, Italy). *Mineralium Deposita*, 58(5), 833–852. <https://doi.org/10.1007/s00126-022-01142-y>
- Gentilucci, M., Djouhou, S. I., **Barbieri, M.,** Hamed, Y. & Pambianchi, G. (2023). Trend Analysis of Streamflows in Relation to Precipitation: A Case Study in Central Italy. *Water (Switzerland)*, 15(8). <https://doi.org/10.3390/w15081586>
- Ghezzi, L.,** Arrighi, S., **Petrini, R.,** Bini, M., Vittori Antisari, L., Franceschini, F., Franchi, M.L. & Gianecchini, R. (2023). Arsenic Contamination in Groundwater, Soil and the Food-Chain: Risk Management in a Densely Populated Area (Versilia Plain, Italy). *Applied Sciences (Switzerland)*, 13(9). <https://doi.org/10.3390/app13095446>
- Ghezzi, L.,** Valerio, M. & **Petrini, R.** (2023). Novel Determination of Elemental Mercury in Silicate Rock by Thermal Desorption. *Analytical Letters*, 56(8), 1270–1278. <https://doi.org/10.1080/00032719.2022.2125984>
- Granieri, D., **Lelli, M.,** Mazzarini, F., Cerminara, M., Calusi, B., Scozzari, A. & Menichini, M. (2023). Reply to the comment by Bolognesi. *Geothermics*, 113. <https://doi.org/10.1016/j.geothermics.2023.102754>



Members' Publications

- Granieri, D., Mazzarini, F., Cerminara, M., Calusi, B., Scozzari, A., Menichini, M. & **Lelli, M.** (2023). Shallow portion of an active geothermal system revealed by multidisciplinary studies: The case of Le Biancane (Larderello, Italy). *Geothermics*, 108. <https://doi.org/10.1016/j.geothermics.2022.102616>
- Gutiérrez, X., Bobrowski, N., Rüdiger, J., **Liotta, M.**, Geil, B., Hoffmann, T., Gutiérrez, E., Dinger, F., Montalvo, F., Villalobos, M. & Escobar, D. (2023). Geochemical characterization of volcanic gas emissions at Santa Ana and San Miguel volcanoes, El Salvador, using remote-sensing and in situ measurements. *Frontiers in Earth Science*, 11. <https://doi.org/10.3389/feart.2023.1049670>
- Ibe, C. U., **Langone, A.**, Stuart, F. M., Brogi, A., Caggianelli, A., Liotta, D. & Tursi, F. (2023). Rapid exhumation of young granites in an extensional domain: The example of the Giglio Island pluton (Tuscany). *Geological Magazine*. <https://doi.org/10.1017/S0016756823000420>
- Inostroza, M., Moune, S., **Moretti, R.**, Burckel, P., Chilin-Eusebe, E., Dessert, C., Robert, V. & Gorge, C. (2023). Major and trace element emission rates in hydrothermal plumes in a tropical environment. The case of La Soufrière de Guadeloupe volcano. *Chemical Geology*, 632. <https://doi.org/10.1016/j.chemgeo.2023.121552>
- Knauss, K.G., **Saldi, G.D.** & Spycher, N.F. (2023). Zeolitization of a devitrified high-silica rhyolitic tuff producing dachiardite: A comparison of hydrothermal experiments with the corresponding reaction progress modeling. *Applied Geochemistry*, 155. <https://doi.org/10.1016/j.apgeochem.2023.105741>
- Kruszewski, M., **Montegrossi, G.** & Saenger, E.H. (2023). The risk of fluid-injection-induced fault reactivation in carbonate reservoirs: an investigation of a geothermal system in the Ruhr region (Germany). *Geomechanics and Geophysics for Geo-Energy and Geo-Resources*, 9(1). <https://doi.org/10.1007/s40948-023-00573-9>
- Lajin, B., Obermayer-Pietsch, B., **Somma, R.** & Goessler, W. (2023). A time-course investigation of the human urinary excretion of the hydrogen sulfide biomarker trimethylsulfonium. *Environmental Toxicology and Pharmacology*, 100. <https://doi.org/10.1016/j.etap.2023.104162>
- Lajin, B., **Somma, R.**, Obermayer-Pietsch, B. & Goessler, W. (2023). Trace determination of the hydrogen sulfide biomarker thiosulfate in human urine by HPLC coupled with element selective ICPMS/MS detection. *Analytica Chimica Acta*, 1237. <https://doi.org/10.1016/j.aca.2022.340583>
- Lanari, R., Faccenna, C., **Natali, C.**, Şengül Uluocak, E., Fellin, M. G., Becker, T. W., Göğüş, O. H., Youbi, N., Clementucci, R. & Conticelli, S. (2023). The Atlas of Morocco: A Plume-Assisted Orogeny. *Geochemistry, Geophysics, Geosystems*, 24(6). <https://doi.org/10.1029/2022GC010843>
- Layana, S., Aguilera, F., Inostroza, M., **Tassi, F.**, Wilkes, T. C., Bredemeyer, S., González, C., Pering, T.D. & McGonigle, A. J. S. (2023). Evolution of the magmatic-hydrothermal system at Lastarria volcano (Northern Chile) between 2006 and 2019: Insights from fluid geochemistry. *Frontiers in Earth Science*, 11. <https://doi.org/10.3389/feart.2023.1114001>
- Leicher, N., Giaccio, B., Pereira, A., Nomade, S., Monaco, L., Mannella, G., Galli, P., Peronance, E., Palladino, D. M., Sottili, G., **Zanchetta, G.** & Wagner, B. (2023). Central Mediterranean tephrochronology between 313 and 366 ka: New insights from the Fucino palaeolake sediment succession. *Boreas*, 52(2), 240–271. <https://doi.org/10.1111/bor.12610>
- Lenzi, S., Magnani, M., **Baneschi, I.**, Giamberini, M., **Raco, B.**, Vivaldo, G. & Provenzale, A. (2023). Spatial and temporal variability of carbon dioxide fluxes in the Alpine Critical Zone: The case of the Nivolet Plain, Gran Paradiso National Park, Italy. *PLoS ONE*, 18(5 MAY). <https://doi.org/10.1371/journal.pone.0286268>
- Li Vigni, L.**, Daskalopoulou, K., **Calabrese, S.**, Brusca, L., Bellomo, S., **Cardellini, C.**, Kyriakopoulos, K., **Brugnone, F.**, Parello, F. & **D'Alessandro, W.** (2023). Hellenic karst waters: geogenic and anthropogenic processes affecting their geochemistry and quality. *Scientific Reports*, 13(1). <https://doi.org/10.1038/s41598-023-38349-6>
- Li Vigni, L.**, Daskalopoulou, K., **Calabrese, S.**, Kyriakopoulos, K., Bellomo, S., Brusca, L., **Brugnone, F.** & **D'Alessandro, W.** (2023). Characterization of trace elements in thermal and mineral waters of Greece. *Environmental Science and Pollution Research*, 30(32), 78376–78393. <https://doi.org/10.1007/s11356-023-27829-x>
- Li, W.-S., Ni, P., Pan, J.-Y., **Albanese, S.**, De Vivo, B., Esposito, R. & Ding, J.-Y. (2023). The genetic association between vein and skarn type tungsten mineralization in the Yaogangxian tungsten deposit, South China: Constraints from LA-ICP-MS analysis of individual fluid inclusion. *Ore Geology Reviews*, 159. <https://doi.org/10.1016/j.oregeorev.2023.105544>
- Lin, X., Chang, H., **Cicchella, D.**, Wu, Q., Meng, G. & Yaqoubi, A. (2023). Statistical self-similarity of detrital zircon U-Pb ages reveals sedimentary provenance: A case study from the Chinese Loess Plateau. *Journal of Geochemical Exploration*, 253. <https://doi.org/10.1016/j.gexplo.2023.107277>
- Lipperera, M. C., Werban, U., **Rossetto, R.** & Vienken, T. (2023). Understanding and predicting physical clogging at managed aquifer recharge systems: A field-based modeling approach. *Advances in Water Resources*, 177. <https://doi.org/10.1016/j.advwatres.2023.104462>
- Liu, X., Dong, Z., **Baccolo, G.**, Gao, W., Li, Q., Wei, T. & Qin, X. (2023). Distribution, composition and risk assessment of PAHs and PCBs in cryospheric watersheds of the eastern Tibetan Plateau. *Science of the Total Environment*, 890. <https://doi.org/10.1016/j.scitotenv.2023.164234>
- Llano, J., **Calabrese, S.**, Lamberti, M. C., **Li Vigni, L.**, **Brugnone, F.**, Sierra, D., García, S., Carbajal, F., Brusca, L., **D'Alessandro, W.** & Augusto, M. (2023). Hydrogeochemistry of trace and rare earth elements in the Cavihue-Copahue Volcanic Complex. *Chemical Geology*, 634. <https://doi.org/10.1016/j.chemgeo.2023.121602>



Members' Publications

- Lo Forte, F. M., Aiuppa, A., Rotolo, S. G. & Zanon, V.** (2023). Temporal evolution of the Fogo Volcano magma storage system (Cape Verde Archipelago): a fluid inclusions perspective. *Journal of Volcanology and Geothermal Research*, 433. <https://doi.org/10.1016/j.jvolgeores.2022.107730>
- Lo Medico, F., Varrica, D. & Alaimo, M.G.** (2023). Occurrence of palladium and platinum in human scalp hair of adolescents living in urban and industrial sites. *Science of the Total Environment*, 892. <https://doi.org/10.1016/j.scitotenv.2023.164777>
- Lopez, T., Fischer, T. P., Plank, T., Malinverno, A., **Rizzo, A. L.**, Rasmussen, D. J., Cottrell, E., Werner, C., Kern, C., Bergfeld, D., Andrys, J. L. & Kelley, K. A. (2023). Tracking carbon from subduction to outgassing along the Aleutian-Alaska Volcanic Arc. *Science Advances*, 9(26), eadf3024. <https://doi.org/10.1126/sciadv.adf3024>
- Mancinelli, M., Martucci, A., Salani, G. M., **Bianchini, G.**, Gigli, L., Plaisier, J. R. & Colombo, F. (2023). High temperature behaviour of Ag-exchanged Y zeolites used for PFAS sequestration from water. *Physical Chemistry Chemical Physics*, 25(29), 20066–20075. <https://doi.org/10.1039/d3cp01584j>
- Mantovani, L., De Matteis, C., Tribaudino, M., Boschetti, T., Funari, V., **Dinelli, E., Toller, S. & Pelagatti, P.** (2023). Grain size and mineralogical constraints on leaching in the bottom ashes from municipal solid waste incineration: a comparison of five plants in northern Italy. *Frontiers in Environmental Science*, 11. <https://doi.org/10.3389/fenvs.2023.1179272>
- Marécal, V., Voisin-Plessis, R., Roberts, T. J., **Aiuppa, A.**, Narivelo, H., Hamer, P. D., Josse, B., Guth, J., Surl, L. & Grellier, L. (2023). Halogen chemistry in volcanic plumes: a 1D framework based on MOCAGE 1D (version R1.18.1) preparing 3D global chemistry modelling. *Geoscientific Model Development*, 16(10), 2873–2898. <https://doi.org/10.5194/gmd-16-2873-2023>
- Mazzini, A., **Sciarra, A.**, Lupi, M., Ascough, P., Akhmanov, G., Karyono, K. & Husein, A. (2023). Deep fluids migration and submarine emersion of the Kalang Anyar mud volcano (Java, Indonesia): A multidisciplinary study. *Marine and Petroleum Geology*, 148. <https://doi.org/10.1016/j.marpetgeo.2022.105970>
- Metcalfe, A., Moune, S., Komorowski, J.-C., Robertson, R., Christopher, T. E., Joseph, E. P. & **Moretti, R.** (2023). Diverse magma storage and major and volatile magma composition: What are the implications on the eruptive style across a volcanic arc? An example of the Lesser Antilles Arc. *Earth-Science Reviews*, 241. <https://doi.org/10.1016/j.earscirev.2023.104440>
- Metcalfe, A., Moune, S., **Moretti, R.**, Komorowski, J.-C. & Aubry, T. J. (2023). Volatile emissions from past eruptions at La Soufrière de Guadeloupe (Lesser Antilles): insights into degassing processes and atmospheric impacts. *Frontiers in Earth Science*, 11. <https://doi.org/10.3389/feart.2023.1143325>
- Minissale, A., **Vaselli, O.**, Marchev, P. & **Tassi, F.** (2023). Geochemistry of thermal springs and associated gases along the Strymon River Valley (Bulgaria and Greece). *Journal of Geochemical Exploration*, 252. <https://doi.org/10.1016/j.gexplo.2023.107262>
- Movsisyan, N., **Albanese, S.**, Pyuskyulyan, K., Hovhannisyan, S. & Belyaeva, O. (2023). The spatiotemporal variation, background, and baseline activities of radionuclides in the soil of Aragats Massif (Armenia). *Environmental Science and Pollution Research*, 30(34), 82647–82660. <https://doi.org/10.1007/s11356-023-28231-3>
- Najafian, T., Mokhtari, A. R., Shahrestani, S. & **Albanese, S.** (2023). Is the pathway length of sediments relevant to assess the background value in stream sediment geochemical exploration? *Journal of Geochemical Exploration*, 253. <https://doi.org/10.1016/j.gexplo.2023.107278>
- Narduzzi, F.**, Ponton, M., Marelllo, M., Paulo De Castro, M., Queiroga, G., & De Min, A. (2023). Geochemical characterization, U-Pb apatite geochronology, and geodynamic significance of olivine minette dykes from the Julian Alps, NE Italy. *Geological Magazine*, 160(6), 1098–1113. <https://doi.org/10.1017/S0016756823000183>
- Nawab, J., Khan, H., Ghani, J., Zafar, M. I., Khan, S., **Toller, S.**, Fatima, L., & Hamza, A. (2023). New insights into the migration, distribution and accumulation of micro-plastic in marine environment: A critical mechanism review. *Chemosphere*, 330. <https://doi.org/10.1016/j.chemosphere.2023.138572>
- Pallottini, M., Goretti, E., Argenti, C., La Porta, G., Tositti, L., **Dinelli, E.**, Moroni, B., Petroselli, C., Gravina, P., Selvaggi, R. & Cappelletti, D. (2023). Butterflies as bioindicators of metal contamination. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-023-28930-x>
- Portaro, M., **Tuccimei, P.**, Galli, G., **Soligo, M.**, Longoni, C. & Vasquez, D. (2023). Testing the Properties of Radon Barrier Materials and Home Ventilation to Mitigate Indoor Radon. *Atmosphere*, 14(1). <https://doi.org/10.3390/atmos14010015>
- Punturo, R., Ricchiuti, C., Giorno, E., **Apollaro, C.**, Miriello, D., Visalli, R., Pinizzotto, M. R., Cantaro, C. & Bloise, A. (2023). Potentially toxic elements (PTEs) in actinolite serpentite host rocks: a case study from the Basilicata Regio (Italy). *Ophioliti*, 48(2), 93–104. <https://doi.org/10.4454/ofioliti.v48i2.563>
- Randazzo, A., Zorzi, F., Venturi, S.**, Bicocchi, G., **Viti, G.**, Tatàno, F. & **Tassi, F.** (2023). Degradation of biogas in a simulated landfill cover soil at laboratory scale: Compositional changes of main components and volatile organic compounds. *Waste Management*, 157, 229–241. <https://doi.org/10.1016/j.wasman.2022.12.027>
- Ricci, A.**, Cremonini, S., Severi, P., **Tassi, F.**, **Vaselli, O.**, **Rizzo, A. L.**, **Caracausi, A.**, Grassa, F., Fiebig, J. & Capaccioni, B. (2023). Sources and migration pathways of methane and light hydrocarbons in the subsurface of the Southern Po River Basin (Northern Italy). *Marine and Petroleum Geology*, 147. <https://doi.org/10.1016/j.marpetgeo.2022.105981>
- Rizzo, G., **Buccione, R.**, Curcio, R., Gargiulo, B. & Sogliani, F. (2023). Multi-analytical characterization and provenance assessment on the mortars of Satrianum (Italy). *Rendiconti Online Società Geologica Italiana*, 60. <https://doi.org/10.3301/ROL.2023.31>



Members' Publications

- Rizzo, P., Bucci, A., Monaco, P., Sanangelantoni, A. M., Naclerio, G., Rossi, M., **Iacumin, P.**, Bianchi, F., Mucchino, C., Riboni, N., Caputi, A. & Celico, F. (2023). Investigating the Potential Impact on Shallow Groundwater Quality of Oily Wastewater Injection in Deep Petroleum Reservoirs: A Multidisciplinary Evaluation at the Val d'Agri Oilfield (Southern Italy). *Sustainability (Switzerland)*, 15(12). <https://doi.org/10.3390/su15129161>
- Rolfo, M. F., Bini, M., Di Mario, F., Ferracci, A., Giaccio, B., Hsun-Ming, H., Isola, I., Sadori, L., Shen, C.-C., Vignola, C. & **Zanchetta, G.** (2023). Neanderthal bones collected by hyena at Grotta Guattari, central Italy, 66–65 ka: U/Th chronology and paleoenvironmental setting. *Quaternary Science Reviews*, 311. <https://doi.org/10.1016/j.quascirev.2023.108132>
- Rotiroti, M., **Sacchi, E.**, Caschetto, M., Zanotti, C., Fumagalli, L., Biasibetti, M., Bonomi, T. & Leoni, B. (2023). Groundwater and surface water nitrate pollution in an intensively irrigated system: Sources, dynamics and adaptation to climate change. *Journal of Hydrology*, 623. <https://doi.org/10.1016/j.jhydrol.2023.129868>
- Ryberg, T., Haberland, C., Wawerzinek, B., Stiller, M., Bauer, K., Zanetti, A., **Ziberna, L.**, Hetényi, G., Müntener, O., Weber, M.M. & Krawczyk, C.M. (2023). 3-D imaging of the Balmuccia peridotite body (Ivrea–Verbano zone, NW-Italy) using controlled source seismic data. *Geophysical Journal International*, 234(3), 1985–1998. <https://doi.org/10.1093/gji/ggad182>
- Saldi, G.D.**, Knauss, K.G., Spycher, N., Oelkers, E.H. & Jones, A.P. (2023). A combined experimental and modelling study of granite hydrothermal alteration. *Geothermics*, 108. <https://doi.org/10.1016/j.geothermics.2022.102633>
- Santangelo, M., Althuwaynee, O., Alvioli, M., Ardizzone, F., Bianchi, C., Bornaetxea, T., Brunetti, M. T., Bucci, F., Cardinali, M., **Donnini, M.**, Yazdani, M. & Fiorucci, F. (2023). Inventory of landslides triggered by an extreme rainfall event in Marche-Umbria, Italy, on 15 September 2022. *Scientific Data*, 10(1). <https://doi.org/10.1038/s41597-023-02336-3>
- Santi, P., Renzulli, A., Veneri, F., Tonelli, G., Tramontana, M., **Taussi, M.**, Calcagnile, L., & Quarta, G. (2023). Geological Insights on the Calcareous Tufas (Pietra Spugna) Used as Building and Ornamental Stones in the UNESCO Historical Centre of Urbino (Marche Region, Italy). *Heritage*, 6(5), 4227–4242. <https://doi.org/10.3390/heritage6050223>
- Sappa, G., **Barbieri, M.** & Andrei, F. (2023). Isotope-Based Early-Warning Model for Monitoring Groundwater–Leachate Contamination Phenomena: First Quantitative Assessments. *Water (Switzerland)*, 15(14). <https://doi.org/10.3390/w15142646>
- Simonetti, M., **Langone, A.**, Bonazzi, M., Corvò, S. & Maino, M. (2023). Tectono-metamorphic evolution of a post-Variscan mid-crustal shear zone in relation to the Tethyan rifting (Ivrea-Verbano Zone, Southern Alps). *Journal of Structural Geology*, 173. <https://doi.org/10.1016/j.jsg.2023.104896>
- Somma, R.**, Kumar, V. & Barco, J. (2023). Surface water, groundwater, and soil pollution: Sustainable water and soils resources management and human health risk assessment and ecology". *Chemosphere*, 337. <https://doi.org/10.1016/j.chemosphere.2023.139295>
- Spagnoli, F.** & Ravaioli, M. (2023). Dissolved fluxes of nutrients and carbon at the sediment-water interface in the Adriatic Sea: review of early data and methods from the Italian National Research Council (CNR). *Advances in Oceanography and Limnology*, 14(1). <https://doi.org/10.4081/aiol.2023.11094>
- Storck, J.-C., Greber, N. D., Duarte, J. F. V., Lanari, P., **Tiepolo, M.** & Pettke, T. (2023). Molybdenum and titanium isotopic signatures of arc-derived cumulates. *Chemical Geology*, 617. <https://doi.org/10.1016/j.chemgeo.2022.121260>
- Taracsák, Z., Mather, T. A., Ding, S., Plank, T., Brounce, M., Pyle, D. M., **Aiuppa, A.** & EIMF. (2023). Sulfur from the subducted slab dominates the sulfur budget of the mantle wedge under volcanic arcs. *Earth and Planetary Science Letters*, 602. <https://doi.org/10.1016/j.epsl.2022.117948>
- Taussi, M.**, Nisi, B., Brogi, A., Liotta, D., **Zucchi, M.**, **Venturi, S.**, **Cabassi, J.**, **Boschi, G.**, Ciliberti, M. & **Vaselli, O.** (2023). Deep Regional Fluid Pathways in an Extensional Setting: The Role of Transfer Zones in the Hot and Cold Degassing Areas of the Larderello Geothermal System (Northern Apennines, Italy). *Geochemistry, Geophysics, Geosystems*, 24(6). <https://doi.org/10.1029/2022GC010838>
- Varrica, D.** & Alaimo, M.G. (2023). Determination of Water-Soluble Trace Elements in the PM₁₀ and PM_{2.5} of Palermo Town (Italy). *International Journal of Environmental Research and Public Health*, 20(1). <https://doi.org/10.3390/ijerph20010724>
- Vespasiano, G.**, Cianflone, G., Marini, L., De Rosa, R., Polemio, M., Walraevens, K., **Vaselli, O.**, **Pizzino, L.**, **Cinti, D.**, **Capecchiacci, F.**, Dominici, R. & **Apollaro, C.** (2023). Hydrogeochemical and isotopic characterization of the Gioia Tauro coastal Plain (Calabria - southern Italy): A multidisciplinary approach for a focused management of vulnerable strategic systems. *Science of the Total Environment*, 862. <https://doi.org/10.1016/j.scitotenv.2022.160694>
- Vespasiano, G.**, Cianflone, G., **Taussi, M.**, De Rosa, R., Dominici, R. & **Apollaro, C.** (2023). Shallow Geothermal Potential of the Sant'Eufemia Plain (South Italy) for Heating and Cooling Systems: An Effective Renewable Solution in a Climate-Changing Society. *Geosciences (Switzerland)*, 13(4). <https://doi.org/10.3390/geosciences13040110>
- Vespasiano, G.**, Marini, L., Muto, F., Auqué, L. F., De Rosa, R., Jiménez, J., Gimeno, M. J., **Pizzino, L.**, **Sciarra, A.**, Cianflone, G., Bloise, A. & **Apollaro, C.** (2023). A multidisciplinary geochemical approach to geothermal resource exploration: The Spezzano Albanese thermal system, southern Italy. *Marine and Petroleum Geology*, 155. <https://doi.org/10.1016/j.marpetgeo.2023.106407>

Members' Publications



- Vitale, S., **Albanese, S.**, Di Maio, R., **Ambrosino, M.**, **Cicchella, D.**, De Paola, C., Fabozzi, C., Notaro, P., Pagliara, F., Prinzi, E. P., Salone, R. & Ciarcia, S. (2023). Insights on the active Southern Matese Fault system through geological, geochemical, and geophysical investigations of the CO₂ gas vent in the Solopaca area (southern Apennines, Italy). *Tectonophysics*, 846. <https://doi.org/10.1016/j.tecto.2022.229657>
- Vivaldo, G., Magnani, M., **Baneschi, I.**, Boiani, M. V., Catania, M., Giamberini, M., Parisi, A., **Raco, B.** & Provenzale, A. (2023). Carbon dioxide exchanges in an alpine tundra ecosystem (Gran Paradiso National Park, Italy): A comparison of results from different measurement and modelling approaches. *Atmospheric Environment*, 305. <https://doi.org/10.1016/j.atmosenv.2023.119758>
- Viveiros, F., Baldoni, E., Massaro, S., Stocchi, M., Costa, A., **Caliro, S.**, **Chiodini, G.** & Andrade, C. (2023). Quantification of CO₂ degassing and atmospheric dispersion at Caldeiras da Ribeira Grande (São Miguel Island, Azores). *Journal of Volcanology and Geothermal Research*, 438. <https://doi.org/10.1016/j.jvolgeores.2023.107807>
- Voloschina, M., Métrich, N., Bertagnini, A., Marianelli, P., **Aiuppa, A.**, Ripepe, M. & Pistolesi, M. (2023). Explosive eruptions at Stromboli volcano (Italy): a comprehensive geochemical view on magma sources and intensity range. *Bulletin of Volcanology*, 85(6). <https://doi.org/10.1007/s00445-023-01647-y>
- Voltattorni, N.**, Gasparini, A. & Galli, G. (2023). The Analysis of ²²²Rn and ²²⁰Rn Natural Radioactivity for Local Hazard Estimation: The Case Study of Cerveteri (Central Italy). *International Journal of Environmental Research and Public Health*, 20(14). <https://doi.org/10.3390/ijerph20146420>
- Watts, M. J., Argyraki, A., **Barbieri, M.**, Brown, A., Button, M., Finkelman, R., Gibson, G., Humphrey, O., Huo, X., Hursthouse, A. S., Zhang, C. & Zia, M. (2023). Editorial: The society for environmental geochemistry and health (SEGH): 50 years and beyond. *Environmental Geochemistry and Health*, 45(4), 1165–1171. <https://doi.org/10.1007/s10653-021-01192-7>
- Yu, W., Oggiano, G., **Mongelli, G.**, Zhou, J., **Buccione, R.**, Xu, L., Mameli, P. & Du, Y. (2023). U-Pb detrital zircon ages and Hf isotope from Sardinia and Adria Cretaceous bauxite (Italy): Constraints on the Alpine Tethys paleogeography and tectonic evolution. *Ore Geology Reviews*, 153. <https://doi.org/10.1016/j.oregeorev.2022.105272>
- Zanelli, D., Candotto Carniel, F., Fortuna, L., **Pavoni, E.**, Jehová González, V., Vázquez, E., Prato, M. & Tretiach, M. (2023). Interactions of airborne graphene oxides with the sexual reproduction of a model plant: When production impurities matter. *Chemosphere*, 312. <https://doi.org/10.1016/j.chemosphere.2022.137138>
- Zheng, C., Yuan, F., Luo, X., Li, X., Liu, P., Wen, M., Chen, Z. & **Albanese, S.** (2023). Mineral prospectivity mapping based on Support vector machine and Random Forest algorithm – A case study from Ashele copper–zinc deposit, Xinjiang, NW China. *Ore Geology Reviews*, 159. <https://doi.org/10.1016/j.oregeorev.2023.105567>
- Zhong, J., Wang, L., **Caracausi, A.**, Galy, A., Li, S.-L., Wang, W., Zhang, M., Liu, C.-Q., Liu, G.-M. & Xu, S. (2023). Assessing the Deep Carbon Release in an Active Volcanic Field Using Hydrochemistry, $\delta^{13}\text{C}_{\text{DIC}}$ and $\Delta^{14}\text{C}_{\text{DIC}}$. *Journal of Geophysical Research: Biogeosciences*, 128(4). <https://doi.org/10.1029/2023JG007435>