Comitato Scientifico del Congresso 2024 - SGI-SIMP
Sondaggio e.mail
Minuta

Sulla base delle risposte ricevute entro le 24.^{00} del 29 gennaio 2024, è stato inviato un sondaggio e.mail (vedi Allegato) ai membri del comitato scientifico del Congresso Internazionale "*Geology for a sustainable management of our planet*", organizzato congiuntamente dalla Società Geologica Italiana (SGI - 93° Congresso), in veste di capofila, e dalla Società Italiana di Mineralogia e Petrologia (SIMP).

Al sondaggio hanno preso parte con risposta e.mail entro i termini: Lucia Angiolini, Giuseppina Balassone, Domenico Calcaterra, Serafina Carbone, Chiara Cardaci, Domenico Chiarella, Angelo Cipriani, Paolo Conti, Sandro Conticelli, Giovanni De Giudici, Patrizia Fiannacca, Diego Gatta, Guido Giordano, Lara Maritan, Annalisa Martucci, Ilaria Mazzini, Stefano Mazzoli, Barbara Nisi, Stefano Poli, Giovanna Rizzo, Laura Scognamiglio, Mauro Soldati, Mario Tribaudino e Chiara Varone.

I risultati al sondaggio sono stati i seguenti:

Quesito 1: A = 24; B = 0.

Quesito 2: A = 1; B =10; C = 13.

Quesito 3: A = 2; B= 22.

Quesito 4: A = 2; B = 0; C = 22.

Pertanto, le decisioni del comitato scientifico sono le seguenti:

1) accorpamenti proposte P1-P2, P86-P90 e P87-P104: è approvato all'unanimità il lavoro effettuato dalle/dai colleghe/i per l'accorpamento delle proposte;
2) accorpamento P52-P53: è approvato a maggioranza semplice, che le due sessioni siano accorpate senza la concessione del settimo "convenor";
3) accorpamento P82-P85: si prende atto della volontà del proponente della P82 di ritirarla, si ringraziano il dott. Gamberi e il Prof. Ciarcia per la disponibilità mostrata, e si approva che la proposta P85 possa essere attivata;
4) accorpamento sessioni P18-P22-P23-P48: vista la perdurante volontà al ritiro della proposta P23, e la non disponibilità all'accorpamento del proponente della proposta P48 con le altre, si ringraziano tutti i proponenti per le proposte avanzate, e si accoglie che la P18 e la P22 possano essere accorpate mentre la P48, vista la perdurante non disponibilità all'accorpamento dei proponenti, non sia attivata.

Viene allegato, inoltre alla presente l'elenco delle sessioni attivate per la raccolta preliminare degli "abstract", ricordando ai proponenti che per un convegno di 3 giornate solo 40-45 sessioni scientifiche potranno essere attivate, e che a valle della chiusura della sottomissione degli "abstract" il comitato scientifico si riserva, vista la quantità di abstract ricevuti, di attivare definitivamente quelle più rappresntative della comunità scientifica nazionale ed estera.

Estensore Minuta: Dott.ssa Giulia Innamorati

Da: **Sandro Conticelli** sandro.conticelli@unifi.it
Oggetto: Fwd: Bari 2024 - Situazione accorpamenti 30 Gennaio 2024
Data: 30 gennaio 2024, 18:02
A: Bernardo Carmina bernardo.carmina@unipi.it
Cc: Sandro Conticelli sandro.conticelli@unifi.it, Laura Scognamiglio laura.scognamiglio@ingv.it, Ilaria Mazzini ilaria.mazzini@gmail.com, Lucia Angiolini (lucia.angiolini) lucia.angiolini@unimi.it, giuseppina.balassone@unina.it, Domenico Calcaterra domenico.calcaterra@unina.it, Angelo Camerlenghi acamerlenghi@ogs.it, carbone@unict.it, Cardaci Chiara chiara.cardaci@protezionecivile.it, Chiarella, Domenico Domenico.Chiarella@rhul.ac.uk, Angelo Cipriani angelo.cipriani@isprambiente.it, Paolo Conti paolo.conti@unisi.it, Giovanni De Giudici gbgiudic@unica.it, Patrizia Fiannacca patrizia.fiannacca@unict.it, Diego Gatta diego.gatta@unimi.it, Guido Giordano guido.giordano@uniroma3.it, lara maritan lara.maritan@unipd.it, annalisa.martucci@unife.it, Barbara Nisi barbara.nisi@igg.cnr.it, Stefano Poli stefano.poli@unimi.it, Dott.ssa Giovanna Rizzo giovanna.rizzo@unibas.it, Mauro Soldati mauro.soldati@unimore.it, Mario Tribaudino mario.tribaudino@unito.it, Emanuela Schingaro emanuela.schingaro@uniba.it, luisa. sabato luisa.sabato@uniba.it, marcello.tropeano marcello.tropeano@uniba.it, Fabio Petti fabio.petti@socgeol.it, Alessandro Zuccari alessandro.zuccari@socgeol.it, Giulia Innamorati giulia.innamorati@uniroma1.it, Lorenza Fascio segreteria@socminpet.it, Stefano Mazzoli stefano.mazzoli@unicam.it, Chiara Varone chiara.varone@igag.cnr.it

Care e cari,

come avrete avuto la possibilità di vedere dal matewriale inviato da Bernardo Carmina, che ringrazio per la sua disponibilità e celerità nello svolgere in maniera certosina il suo compito organizzativo, la maggior parte dei colleghi invitati alla revisione delle loro proposte nell'ottica dell'accorpamento di quelle simili per tematica ha presentato delle nuove sessioni accorpate con una sola eccezione palese.

A questo riguardo Vi chiedo di esprimere il Vostro parere per e.mail rispondendo ai quesiti sottoistanti facendo reply to all/rispondi a tutti a uqesta mail.

1 - come valutate il lavoro effettuato dalle/dai colleghe/i nell'effuare gli accorpamenti sottostanti:

A) positivo

B) negativo

TOPIC	OLD	TITOLO	STATO	MAIN CONVENERS
Biogeosciences	P1-P2	*Geobiological and geochemical integrate approaches for detection of new environmental proxies stored in modern to ancient bioconstructions and biominerals*	ACCORPATA	*Cipriani-Borrelli*
Hanno confermato l'accorpamento mandando un titolo provvisorio. Domani entro le 17 manderanno il medaglione e l'elenco dei conveners				
Stratigraphy and Sedimentology	P86-P90	*Source-to-sink processes and genesis of resources in sedimentary deposits: advances in understanding of geologic and environmental dynamics through a multidisciplinary perspective*	ACCORPATA	*Micheletti-Tangari*
OK				
Stratigraphy and Sedimentology	P87-P104	*Burial/exhumation history of sedimentary basins: linking deep-seated and surface processes and applications for a sustainable future*	ACCORPATA	*Corrado-Schito*
OK				

2 - preso atto del fatto che i proponenti delle sottostanti sessioni P52 e P53 hanno comunque fatto il lavoro di accorpamento richiesto, hanno garbatamente mostrato lke loro perplessità essendo i due temi mal conciliabili. A questo riguardo chiedono che vengano portati a 7 i convenors propio per non dover tagliare esperti qualificati della sessione. A tal riguardo Vi chiediamo se siete d'accordo su uno dei seguenti posizioni:

A) si riconosce che le perplessità siano fondate e quindi si accorda la prosecuzione delle sessioni originarie;

B) si riconosce che le perplessità siano fondate e quindi e si accorda la la possibilità "una-tantum" di portare a 7 il numero dei convenors;

C) si riconosce che le perplessità siano fondate ma NON si accorda di portare a 7 il numero dei convenors;

Natural Hazards and risks	**P52-P53**	*Sinkholes vs. land subsidence: assessment of the geological hazards and impacts on environment and society*	ACCORPATA	***Parise-Ruberti***
Pur rinnovando le perplessità per l'accorpamento hanno proposto un nuovo titolo. Chiedono di poter portare il numero dei conveners a 7 per evitare ulteri esclusioni.				

3) valutata la richiesta di ritiro della sessione proposta dal dott. Gamberi e la disponibilità ad accorpare da parte del Prof. Ciarcia si propende per:

A) chiedere al dott. Gamberi di NON ritirare la sua proposta e di proseguire con l'accorpamento;

B) si ringrazia il dott. Gamberi e il Prof. Ciarcia per la disponibilità e si approva che la sessione P85 possa essere non accorpata;

Stratigraphy and Sedimentology	P82-P85	***TITOLO DA DEFINIRE***	?	***Ciarcia-Gamberi***
Gamberi vuole ritirare la proposta mentre Ciarcia si dimostra dispiaciuto per la decisione presa dal collega				

4) valuatata la situazione articolata si propone:

A) di chiedere al dott. Miele di non ritirarsi e al dott. Cirillo di addivineri a miti consigli per effettuare l'accorpamento richiesto, anche se questo richiederebbe un SUPPLEMENTO DI LAVORO NELL'ATTESA CHE ALTRI INVIINO COMUNQUE LE LORO PROPOSTE;

B) di accettare la disponibilità all'accorpamento da parte dei Fazio e Calacicco, di accettare il ritiro da parte di Miele, e di mantenere in vita la sessione di Cirillo che NON vuole accorparsi;

C) di accettare la disponibilità all'accorpamento da parte dei Fazio e Calacicco, di accettare il ritiro da parte di Miele, e di ringraziare il dott. Cirillo per aver sottomesso la sua proposta ma che venendo meno alle richieste del comitato scientifico, in questa situazione di forte criticità, non viene approvata la sua proposta.;

Earth observation and modelling	**P18-P22-P23-P48**	***TITOLO DA DEFINIRE***	?	***Fazio-Cirillo-Colacicco-Mie***
Miele si è ritirato. Cirillo è rimasto sulle sue posizioni mentre Fazio e Colaciccio si sono dimostrati favorevoli ad un accorpamento con il nuovo titolo "Integr remote sensing methodologies and advanced digital mapping "				

Aspettiamo Vostre valutazini sui quatto punti. Vi preghiamo di esprire Vostro parere secco con numero + opzione es

1-D
2-F
3-G
4-L

Grato del Vostro impegno un caro saluto a tutte/i

S'

Inizio messaggio inoltrato:

> **Da:** Bernardo Carmina <bernardo.carmina@unipi.it>
> **Oggetto: Bari 2024 - Situazione accorpamenti 30 Gennaio 2024**
> **Data:** 30 gennaio 2024, 13:30:23 CET
> **A:** Sandro Conticelli <sandro.conticelli@unifi.it>
> **Cc:** Laura Scognamiglio <laura.scognamiglio@ingv.it>, Ilaria Mazzini <ilaria.mazzini@gmail.com>, "Lucia Angiolini (lucia.angiolini)" <lucia.angiolini@unimi.it>, "giuseppina.balassone@unina.it" <giuseppina.balassone@unina.it>, Domenico Calcaterra <domenico.calcaterra@unina.it>, Angelo Camerlenghi <acamerlenghi@ogs.it>, "carbone@unict.it" <carbone@unict.it>, Cardaci Chiara <chiara.cardaci@protezionecivile.it>, "Chiarella, Domenico" <Domenico.Chiarella@rhul.ac.uk>, Angelo Cipriani

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Buonasera a tutt*, come potrete vedere dal file excel sono rimaste solo 2 le sessioni in sospeso.

Le altre hanno tutte comunicato il titolo anche se manca ancora qualche descrizione, vi allego un word contenente gli scambi di email e le descrizioni pervenute.

Mentre vi sto scrivendo è arrivata anche la proposta Fazio-Colacicco che vi allego separatamente.

Il numero totale delle sessioni proposte è 85.

Un caro saluto
Bernardo

ELENCO DELLE SESSIONI

Sommario

T23. Analysis and management of coastal areas, from risk assessment to perspectives arising from new technologies.

T24. Geomaterials for a Sustainable Development

T25. Advanced minero-chemical characterization and processing of waste for a conscious reuse

T26. Geosciences for the characterization, exploration and exploitation of primary and secondary mineral resources

T27. Environmental mineralogy and sustainable development

T28. High-resolution chemical and textural imaging techniques as analytical tools in Earth Sciences

T29. Mineralogy behind Earth processes: insights from the atomic to the macroscopic scale

T30. The science of clays and zeolites: from genesis to sustainable applications

T31. Assessing and mitigating natural risks: the role of geology

T32. Citizen Science for risk reduction strategies and sustainable management

T33. Guidelines and perspectives of seismic microzonation in Italy: from geothematic cartography to numerical modelling

T34. Landslide monitoring, modelling, and prediction: bridging new tools and data to the "slope-failure model" perspective

T35. Multihazard investigation, assessment and mapping techniques in urban areas

T36. Sinkholes vs. land subsidence: assessment of the geological hazards and impacts on environment and society

T37. Understanding the Campi Flegrei magmatic-hydrothermal system and its time changes

T38. Urban developments and natural risks

T39. Wildfires, erosion and landslides in burned areas

T40. Building with Nature: from river corridors to coastlines

T41. Caves, mines and other underground spaces as field laboratories in environmental geology

T42. Digital transition of multiscale geological datasets from satellite imagery to microscale investigations

T43. Experiences of data sharing and use in the frame of Research Data Infrastructures

T44. Geological storage for energy transition: concepts, methods, modelling and applications

T45. Numerical modelling of Earth processes and risks: methodologies and perspectives for quantitative insights in the understanding of the phenomena

T46. Geosciences revamp and sustainable planning strategies: multidisciplinarity is the way

T47. Women in Geosciences: a journey through the social changes from the past to present and future scenarios

T48. The art of Geosciences communication

T49. Geosciences at school 2024

T50. Fossil record, paleoenvironment and climate change throughout the Neogene and Quaternary Earth history

T51. OPEN - Often Petrology Entails Novelties

T52. Opening Pandora's box: inclusions in minerals

T53. Origin and evolution of ophiolite suites and their mineralization: an interdisciplinary approach

T54. The evolution of the Earth's lithosphere: clues from mantle rocks, primary melts and crustal sections

T55. New frontiers of Planetary Geology

T56. Challenges in the characterization of active faults: the contribution from seismology, geodesy, and structural analysis

T57. Carbonate platform systems: records of palaeoenvironmental change

T58. Modern and Ancient River Deltas: processes, models and exceptions

T59. Frontiers in the regional geology of the Apennines: a multidisciplinary perspective

T60. Global Stratotype Section and Points (GSSPs) and Standard Auxiliary Boundary Stratotype (SABSs): state of art, current research, and future perspectives

T61. Open session on Stratigraphy

T62. Source-to-sink processes and genesis of resources in sedimentary deposits: advances in understanding of geologic and environmental dynamics through a multidisciplinary perspective.

T63. Burial/exhumation history of sedimentary basins: linking deep-seated and surface processes and applications for a sustainable future

T64. Stratigraphic and morphological markers of extreme events during the Quaternary

T65. The evolution of the Circum-Mediterranean Chains as recorded by stratigraphic, sedimentary, petrographic, and geochemical signals of ancient deep marine systems: new data and recent advances

T66. Geophysics and Tectonics: experimental, theoretical and observational studies

T67. Georesources in orogens and basins: thermal processes, fluid-rock interaction and structural constraints

T68. Groundwater resources innovation and sustainability: from characterisation to management of saturated and unsaturated zone

T69. Innovation toward sustainable and regenerative farming

T70. New frontiers in georesources exploration, exploitation storage and monitoring

T71. New frontiers in sustainable engineering geology design

T72. Recent advances in karst research, with particular focus on underground waters

T73. Sustainable raw material supply to boost the green and digital transition: the role of mineral waste recovery and recycling

T74. Active faults and crustal deformation in the Mediterranean area from prehistorical to present times: state of the art

T75. Evolution of the Variscan crust

T76. Geological and geophysical data, tools, and models for the exploration of the Earth crust in times of energy transition

T77. Geological models at meso and macro scales: new insights for mitigating uncertainty through multidisciplinary approaches

T78. Interplay between Deformation, Fluid Flow and Fluid-Rock Interactions in Sedimentary Rocks: Implications for Seismicity, Basin Analysis and Reservoir Characterization

T79. Multidisciplinary approaches to the geometric and kinematic definition of seismogenic faults

T80. Unveiling earthquake mechanics, from field to laboratory based approach

T81. New challenges in reservoir and seal rocks characterization

T82. Unveiling the long-lasting evolution of active margins from field to micro-scale

T83. Multi-disciplinary investigation of magmatic processes: experimental petrology, eruptive products analysis and numerical modelling to constrain dynamics and timescales of magmatic processes

T84. The power of tephra from micro- to macro-scales: advances and applications of tephrostratigraphy and tephrochronology to the reconstruction of past explosive eruptions

T85. Volcanic deposits as a tool to quantify volcanic hazards towards disaster risk reduction

T86. Open Poster Session

T1. Geobiological and geochemical integrate approaches for detection of new environmental proxies stored in modern to ancient bioconstructions and biominerals

DA DEFINIRE

CONVENERS: Mara Cipriani (Università della Calabria) [mara.cipriani@unical.it], Mario Borrelli (Università della Calabria)

T2. The global challenge of plastic pollution: causes, impacts and solutions

Plastic pollution is a global human-caused problem that affects all environments on Earth causing serious threats to organisms, including humans. Plastic can be found in fresh and marine waters, in soil and sediments and in the air, thus easily entering the trophic chain, geological and biogeochemical cycles. Plastic is now so abundant within the sedimentary record that it has been proposed to be used as a stratigraphic marker of the Anthropocene. The problem is complex and multifaceted, offering a broad scientific overview that ranges from the causes, to the most modern analysis and monitoring techniques, to the impacts on ecosystems and biodiversity up to possible technological solutions that allow for a more sustainable management.
Thanks to the multidisciplinary and integrated approach to the problem, this session aims to stimulate researchers' awareness of different aspects concerning plastic pollution. Main topics could include: monitoring strategies in different environmental contexts, transport and accumulation modelling, problems in sampling, recognition and quantification in environmental matrices, response of organisms, biodegradation and bioremediation, circular economy and many others.

CONVENERS: Nicoletta Mancin (Università di Pavia) [nicoletta.mancin@unipv.it], Maya Musa (Università di Pavia) , Giuseppe Suaria (CNR- Lerici) , Stefania Lisco (Università di Bari) , Angela Rizzo (Università di Bari)

plastic, environmental pollution, biodiversity, persistence, threat, circular economy

T3. Antarctica and the Arctic: unveiling the geological past and future evolution of polar regions

The polar regions offer to geoscientists a broad spectrum of research opportunities. Investigating geological units in non-glaciated areas makes it possible to study the continental and tectonic development, the paleoenvironment of the deep sea and the evolution of paleoclimate. In addition, the ice cover that has characterized these regions in the last tens of million years provides a unique opportunity to study the processes regulating the interaction between ice, rock, and the ocean spanning from the past to the present day. This also enable the evaluation of possible future scenarios.
The session is open to all geological, geophysical, stratigraphic, and geomorphologic studies dealing with Antarctica and the Arctic. The primary goal of the session is to shed light on the tectonic development of the polar regions and the interaction of ice sheets with the bedrock in relation to climate and ocean changes. Contribution dealing with future prospects of these regions and their impact to Earth are also welcomed.

CONVENERS: Luca Zurli (Università di Siena) [luca.zurli@unisi.it], Laura De Santis (Istituto Nazionale di Oceanografia e Geofisica Sperimentale), Fabio Florindo (Istituto Nazionale di Geofisica e Vulcanologia), Caterina Morigi (Università di Pisa), Valerio Olivetti (Università di Padova)

Antarctica; Arctic; polar geology

T4. Multidisciplinary perspectives on Quaternary climate change

The ongoing climate change forces the geoscience community to envision the potential impacts on the lito-atmo-hydro-biosphere as well as the anthroposphere. The Quaternary is the perfect playground to explore similar changes occurred in the past, as a period punctuated by drastic climate shifts and environment instability concurrent with the appearance of Homo species, the rise and fall of ancient societies, and the development of modern cultures often molded by the climate and environmental background.

In the last decades the increased multidisciplinary methodologies among and beyond the Earth Sciences has provided key data to the study of Quaternary climate oscillations and environmental dynamics that had a role in shaping landscapes, habitats, ecosystems and ancient societies. Such approach has also significantly benefited the archaeological and anthropological research, with the rise of Geoarchaeology as an interdisciplinary link between Geosciences and archaeology aimed to unravel potential interactions between archaeological communities and ecosystems.

Thus, this session welcomes inter- and multi-disciplinary contributions enhancing our understanding regarding the change of climate and environment during the Quaternary, its extent, pace and tempo. It is also open to studies regarding the intricate relationship between climate and human resilience and impact. There are no limitations regarding the type of archive selected; geological deposits and proxy records from land and/or sea, statistical models, historical data as well archaeological/anthropological findings are all suitable to perfect the picture about Quaternary, from global to local scale and from multimillennial to intracentennial timescale.

CONVENERS: Luca Forti (Università degli Studi di Milano) [luca.forti@unimi.it], Andrea Columbu (Università di Pisa), Monica Bini (Università di Pisa), Ilaria Isola (INGV, Pisa), Guido Stefano Mariani (Università di Torino) , Andrea Zerboni (Università di Milano)

T5. Chemostratigraphy through time and space: Reconstruction of palaeoenvironment and palaeoclimate by using geochemical proxies and isotopes

Chemostratigraphy is a long-known tool for stratigraphic correlations as well as to identify past climatic and paleoceanographic changes. The elemental and isotopic composition of sedimentary rocks and modern sediments can in fact provide a large amount of information on the depositional environment, such as sediment sources and sediment transports, ocean circulation, past climates, organic productivity and preservation of organic matter, redox conditions of the sea-floor and water column, levels of oxygenation, diagenesis and post-depositional changes in the stratigraphic and sedimentary sequences. Further, the isotopic composition and the concentration of a given element in a rock or sediment sample depends on the relative proportions of its constituent phases, which are primarily derived from the continents, the sea and ocean floor, and the water column. Biological and physical processes during deposition along with post-depositional chemical reactions produce a component mixture that can provide noteworthy information about the palaeoceanographic and palaeoclimatic conditions during the sedimentation. The elemental and isotopic composition can thus complement, support, and increase the interpretations resulting from the sedimentary and paleontological investigations. Thus, chemostratigraphy is one of the most intriguing topics and powerful tools to unravel the complex processes that controlled Earth's evolution, global changes and their interplay with biotic evolution. Spanning from the Paleozoic to the Present, the session welcomes contributions addressing different time scales and stratigraphic resolutions, from centennial scales to millions of years.

CONVENERS: Manuel Rigo (Università di Padova) [manuel.rigo@unipd.it], Irene Cornacchia (CNR), Agata Di Stefano (Università di Catania), Alessandro Mancini (Università degli Studi di Roma "La Sapienza"), Matteo Maron (Università di Chieti-Pescara), Honami Sato (Kyushu University, Fukuoka, Japan)

Palaeoclimate, palaeoenvironments, geochemical proxies, isotopes, reconstruction

T6. Geodiversity for a sustainable planet

Geodiversity is the variety of Earth's physical features, processes, and materials. It was recently suggested that geodiversity would be closely related to biodiversity, ecosystems and human well-being and plays a crucial role in supporting life on Earth and for achieving a sustainable planet.
The session topics provide a comprehensive coverage of various aspects of geodiversity and its crucial role in environmental sustainability:
1. Geodiversity definition and assessment: exploring parameters and methods.
2. Links between biotic and abiotic parameters of the environment for investigating the relationship between geodiversity and biodiversity.
3. Natural Resource Management: understanding the role of geodiversity in valuating resources such as minerals, water, soils.
4. Urban geology: geodiversity as a parameter for planning sustainable cities.
5. Cultural and Aesthetic Values: geodiversity for geoheritage.
6. Educational value: for understanding of environmental issues and a commitment to sustainable practices. This collection of topics covers a wide array of important aspects of geodiversity and its role in fostering environmental sustainability.
The session is supported by the project URGERE - URban GEodiversity for a Resilient Environment, PI Massimiliano Alvioli, CUP B53D23007260006, funded by Italian MUR within the PRIN 2022 through the Next Generation EU funding scheme of European Union.
https://www.irpi.cnr.it/en/project/urgere/

CONVENERS: Laura Melelli (Università degli Studi di Perugia) [laura.melelli@unipg.it], Massimiliano Alvioli (CNR IRPI, Perugia), Paola Coratza (Università degli Studi di Modena e Reggio Emilia), Antonello Fiore (President SIGEA – Società Italiana di Geologia Ambientale), Alessia Pica (Sapienza Università di Roma)

Geodiversity, Geoheritage, Ecosystems, Urban Geology

T7. Geosciences for Cultural Heritages

The session intends to be a forum for a fruitful discussion on the recent advancement of Geosciences applied to Cultural Heritage, encouraging a reflection on the importance of transdisciplinary approaches for interpreting and preserving the materiality of ancient artifacts. Since artistic, archaeological and historical objects are mainly based on geomaterials, geological sciences can be applied for their characterization, opening novel perspectives to trace the exploitation of ancient georesources and the impact of past societal activities on environmental transformations. Moreover, climate changes, landscape degradation and environmental hazards are threatening sub-aerial and underwater environments, making it imperative to develop sustainable products and methods for the conservation of Cultural Heritage materials, and to study their stability over time. Finally, the increasing opportunity offered by digitalization makes it necessary a reflection on the development of common semantics for an improved data management and fruition. High-quality oral and poster presentations that address a variety of applications of scientific methods to the analysis of cultural heritage materials, and that highlight the fundamental and strategic role of Earth Sciences in these multidisciplinary research areas, are highly welcomed.

CONVENERS: Mauro Francesco La Russa (Università della Calabria) [mlarussa@unical.it], Simona Raneri (CNR Pisa), Michele Secco (Università Padova)

geomaterials, provenance, conservation, degradation

T8. Geosciences on display: the role of Natural History Museums in the future of our planet

Geosciences are playing a crucial role in our society, which has to face new challenges in a rapidly evolving planet. In this context, Natural History Museums have a key function in helping society to develop a deeper understanding of both the scientific method and natural systems, with a particular focus on the evolution of the lithosphere, with its mineral resources, and life, as testified by the paleontological record.
This session aims to facilitate the discussion on the role of scientific museums in present-day society. The focus will be mainly devoted to the research and dissemination activities carried out in museums. We welcome contributions on taxonomy, diagnostics, conservation, and valorisation of museum collections and specimens (including digitization and cataloguing), the study of biodiversity, history of science and environment (including the exploitation of geo-resources through the centuries), curatorial aspects (innovative exhibits and storytelling), citizen science, and education. Abstracts regarding geo-sites and case studies on the indicated topics are also recommended.

CONVENERS: Rosarosa Manca (Università di Firenze) [rosarosa.manca@unifi.it], Maura Fugazzotto (Università di Catania), Luca Bellucci (Università di Firenze), Daniela Mauro (Università di Pisa)

museums, geological heritage, education, conservation, dissemination

T9. Raising awareness on geodiversity: a must for the geoscientist

The concept of geodiversity is underpinning equilibrium of natural systems, and is a topic increasingly known.
Geodiversity is important for reconstructing Earth history and the evolution of life on our planet, for this reason is needed to preserve and promote it.
An effort from all members of the civil society is required to foster knowledge about geodiversity, and to integrate principles and methods of nature conservation into the management of geoheritage. To achieve this progress, increased awareness and a greater effort by the communities of geoscientists, geologists and geology enthusiasts are needed.
This session welcomes inputs related to geoconservation within and outside protected areas, such as the development and dissemination of methods for the assessment of geodiversity, application of geoheritage inventories in territorial planning, examples of "good practices".

CONVENERS: Elisa Brustia (Dipartimento per il Servizio Geologico d'Italia, ISPRA) [elisa.brustia@isprambiente.it], Nereo Preto (Università di Padova), Elio Lippolis (Università degli Studi di Bari Aldo Moro), Guillem Mateu Vicens (University of the Balearic Islands), Vito Antonio Venezia (Università degli Studi di Bari Aldo Moro)

natural heritage, geoconservation, protected areas, geoheritage inventories, geodiversity

T10. Vibrational spectroscopy studies of geomaterials in cultural heritage: case studies and new perspectives

The use of molecular vibrational spectroscopies (Raman and infrared) to investigate the materials constituting cultural and geo-heritage has gradually become widespread among the applied mineralogy and petrography scientific community, with the purpose of addressing a wide variety of archaeometric questions. The session is open to researchers from all fields of heritage sciences; it will highlight exceptional advances in methodologies and applications, which help in the interpretation, conservation and the fundamental knowledge of the cultural heritage. Diversified applications are known, from the exploratory investigations to authentication and provenance problems, to the study of alteration and degradation. Furthermore, the developing in the last decades of miniaturized components allowed the design of compact and transportable, to portable and handheld Raman and infrared instruments. This led to the possibility of moving the investigations from the laboratory directly to the sites of interest, such as museums, archaeological sites, geosites, and to the consequent advantage of performing non-invasive analyses, a vital requirement in cultural heritage field. This session can represent the occasion for discussion and update on the most recent applications of laboratory and in-situ Raman and infrared spectroscopies for the study of natural and artificial geomaterials in the cultural heritage field and for gemological purposes.

CONVENERS: Maria Cristina Caggiani (Università di Catania) [mariacristina.caggiani@unict.it], Francesco Di Benedetto (Università di Ferrara), Laura Fornasini (Università di Parma), Laura Medeghini (Sapienza Università di Roma) , Gioacchino Tempesta (Università di Bari)

cultural heritage, geomaterials, spectroscopy, Raman, infrared

T11. Wandering to learn: Geotourism as a medium for the dissemination of Geodiversity

In recent years, a new environmental awareness and a growing concern among some to behave more sustainably have led to a gradual increase in forms of tourism more closely linked to the natural environment. Parks, hiking trails and areas of particular natural value are attracting more and more visitors. Among the new forms of tourism, geotourism is becoming increasingly popular. The special geological features of an area, the landscape, the abiotic environment are attracting an increasing number of tourists. However, real knowledge of the geological phenomena that led to the formation of a particular area or site does not always go hand in hand with greater tourist enjoyment. Geotourism can be an engine of geological knowledge for those who, attracted by the particular beauty of an area, want to learn more about it. This can be achieved through better geological preparation by tour operators, through guided tours that focus more on discovering the abiotic aspects of the landscape. New technologies, such as virtual and augmented reality, and less specialised and more popular communication, which can make geological phenomena easier to understand for non-experts without losing scientific rigour, can be valuable tools for disseminating knowledge of the geological heritage.

CONVENERS: Roberto Pompili (ISPRA Istituto Superiore per la Protezione e Ricerca Ambientale) [roberto.pompili@isprambiente.it], Alessia Amorfini (Parco regionale delle Alpi Apuane), Filippo Bellini (Università degli Studi di Bari Aldo Moro), Luca Antonio Dimuccio (University of Coimbra), Annachiara Rosati (Università degli Studi di Bari Aldo Moro)

Geoheritage, Geodiversity, Geotourism, Geosites

T12. Advances in remote sensing for hazard monitoring and geo-resource management through multi-dimensional digital models

This session explores the forefront of geoscience technology, merging the power of Earth Observation applications and multidimensional digital modeling. It aims to showcase how these advanced tools are revolutionizing our understanding and management of geo-resources and risks. Indeed, the advent of new platforms, sensors, and algorithms provides opportunities to image, assess, and quantify natural processes in different geological settings. We explore the latest developments in techniques such as digital mapping, satellite imaging, airborne and UAV photogrammetry, LiDAR and X- ray/neutron microtomography. The session will highlight how these methods can be used to produce valuable 3D/4D geological data.
The session will comprehensively cover topics such as mapping and monitoring of natural hazards and risks (floods, landslides, earthquakes, and volcanic eruptions), 3D dynamic and static models, 3D virtual outcrops, monitoring of dynamic models, fractured and porous media modelling for reservoir characterization and geostorage.
Challenges in collecting data, automated analysis of digital model data, machine learning implementation, management of large datasets, integration of multi-parametric and multi-dimensional data will be addressed, also by sharing qualitative and quantitative information to foster collaborative advances in the geosciences at various scales. Contributions that connect surface data with 3D subsurface multi-parametric model reconstruction are strongly encouraged.

CONVENERS: Rosa Colacicco (Università di Bari) [rosa.colacicco@uniba.it], Eugenio Fazio (Università di Catania) , Giovanni Forte (Università di Napoli) , Marco La Salandra (Università di Bari) , Miller Zambrano (Università di Camerino) , Martina Zucchi (Università di Bari)

natural risks, monitoring, mapping, dynamic and static models, 3D virtual outcrop

T13. Constraints for 3D geological models of sedimentary basins: restoring the knowledge of surface and subsurface stratigraphy for multiple geological applications

In recent years, subsurface modeling of sedimentary basins has experienced significant advancements, leveraging cutting-edge technologies to create complex 3D representations of sedimentary heterogeneity. 3D modeling still tackles the enduring challenge of combining geometrical and evolutionary information within complex stratigraphic frameworks for practical applications, including geothermal and water resources management, urban planning, material extraction, and geological hazard analysis. The conceptualization of rich surface-subsurface dataset into model constraints faces the inevitable outcome of harmonizing simplicity with the multiscale and nested nature of sedimentary successions, often resulting in inaccurate and uncertain models. To address this challenge, this session invites researchers to explore subsurface models' methodology and outcomes, discussing the integration among geological maps, facies analyses, subsurface stratigraphic correlations, geophysical datasets, and evolutionary interpretations of sedimentary basins. Examples may encompass studies using innovative 3D modelling technique and/or classical geological dataset. The aim is to restore the importance of fundamental geological knowledge and highlight the potential pitfalls and limitations of 3D computation lacking robust conceptual models. Attendees will gain insights into the latest modeling developments of sedimentary basins, enhancing their ability to contribute to sustainable solutions in applied geology and geological engineering, bridging the gap between theoretical models and real-world geological challenges.

CONVENERS: Daniel Tentori (CNR Montelibretti, Roma) [daniel.tentori@igag.cnr.it], Chiara Zuffetti (Università degli Studi di Milano Statale), Edoardo Barbero (CNR Torino)

3D modeling; facies analysis; sedimentary basin analysis; space–time geological constraints; stratigraphy

Se fosse possibile una scelta multipla tra i topics si prega di aggiungere: Stratigraphy and Sedimentology oltre ad Earth observation and modelling

T14. Geological, Geochemical and Petrological methods to understand the evolution of geothermal systems

Among the renewable energies, the geothermal resource plays an important role in the ongoing energy transition. However, it is important to ensure the sustainability and renewability of the resource. To do this, it is necessary to study the establishment of the geothermal system, its evolution, and the present-day situation.
A multidisciplinary approach has to be used, based on geological, geochemical, petrological and geophysical methods, including geothermal fluid analyses and water recharge studies. The evolution of ancient fluids, up to the present setting can be investigated by fluid inclusions, since they are a useful tool, representing closed systems in which part of these fluids have been trapped. Furthermore, sampling of fumaroles and thermal waters can provide information on the present situation. Finally, to better understand the circulation through the system, a detailed study of the recharge water is necessary, therefore, cold springs and meteoric waters can be sampled together with thermal ones, and an isotope hydrological approach can be applied.
This session aims to gather geological, geochemical, and petrological applications, not only limited to the afore mentioned methodologies, useful to study a geothermal system, to better understand its functioning, leading to a correct management of the geothermal resource.

CONVENERS: Evelina Dallara (Università di Pisa) [evelina.dallara@phd.unipi.it], Paolo Fulignati (Università di Pisa), Matteo Lelli (CNR, Pisa), Martina Zucchi (Università di Bari), Andrea Brogi (Università di Bari)

Geothermal system; Geothermal fluids; Fluid inclusion

T15. Recent advancements in the application of conventional and unconventional stable isotopes in environmental sciences and hydrogeological processes

The increasing pressure on water systems at a global scale, under anthropogenic and natural forcing, including climate change, is leading to a depletion of water resources in terms of both quantity and quality. Correct and sustainable management of water resources is a pivotal challenge that humanity must face from now on, and they demand integrated multidisciplinary and multiparametric approaches. Stable isotopes are a handy tool in environmental sciences, from fluid geochemistry to hydrogeology, and their applications are countless. The inventory of stable isotopes, currently applied in water resource management, has continuously grown in the years, from traditional systematics (i.e., oxygen, hydrogen, carbon, nitrogen, and sulfur) toward unconventional isotopes (i.e., transition metals). Stable isotopes can be used to unravel the origin of specific solutes (e.g., pollutants) in surface and groundwaters, in environmental geochemistry, or can be applied, in hydrology, to trace water evolution and origin as well as its circulation patterns and recharge areas in different geological contexts. This session welcomes multidisciplinary contributions focused on applying stable isotopes in different fields of geosciences and promoting innovative approaches and advancements in their use in water resource management.

CONVENERS: Lorenzo Chemeri (Università di Urbino) [l.chemeri@campus.uniurb.it], Marco Taussi (Università di Urbino), Giovanni Vespasiano (Università della Calabria), Davide Fronzi (Università Politecnica delle Marche), Daniele Tardani (Univesidad de O'Higghins)

Stable isotopes; water management; hydrogeology; fluid geochemistry

T16. The remarkable sulfur properties

Sulfur is widely distributed on Earth, participating in a variety of geo- and biochemical processes. Elemental sulfur (S0) occurs in evaporite formations and in volcanic settings. In the past, climate disruption followed massive SO2 injection into the atmosphere, trough eruptive plumes. Due to its complex polymerization behavior, pure S0 viscosity is highly temperature dependent, experiencing a 10,000 fold -increase at ~160_C, until a maximum around 186-188oC. This viscosity pattern is not respected in the presence of organics, H2S(x), ammonia, halogens. This behavior remains poorly investigated, despite the high impurity of volcanic sulfur. S-layers accumulated at depth within volcanoes could explain contrasting geochemical signals at the surface following the scrubbing of critical species. In the ultimate case, S-viscosity variations could seal the volcanic system, leading to its overpressurization, and unheralded failure. Several eruptions were attributed to a system sealing at depth. Our knowledge of these processes is poor. Implications for hazard assessment are envisaged.
This session invites all studies that can improve the knowledge on S-properties in any state. Quantitative results, in situ sampling, mapping, continuous direct monitoring, remote sensing analyses. Experimental findings on S-viscosity at different pressure (mostly low) and temperatures (typical for hydrothermal systems) are particularly welcome

CONVENERS: Teresa Scolamacchia (A.S.S.E.T.- Regione Puglia)
[t.scolamacchia@asset.regione.puglia.it], Jacopo Cabassi (CNR, Firenze)

sulfur, hydrothermal systems, volcanic eruptions, hazard assessment

T17. BACK TO THE FUTURE. History of geological studies and mapping as a key for sustainable development

Knowledge of the territory is the basic requirement for a sustainable development. In these terms, the experience of the geoscientists of the past represents a precious legacy for present and future generations. Consistently with the main theme of the Congress, this session focuses on the valorization of previous geological studies and mapping as tools for a modern and ethical approach to land planning and management, and risk prevention and mitigation. Contributions on history of geological studies are warmly encouraged, with special attention to less developed areas of the Planet, which have been overexploited, in near and distant past, regardless of environment preservation. To this regard, an interesting insight can be traced in the history of geological research in Southern Italy, Sardinia and Sicily; a particular discussion is proposed here on what we can call, borrowing a well-known concept of Italian historiography, the "questione geologica meridionale".
From a particular point of view, looking 'back to the future', history of geosciences can effectively contribute to analyze the worldwide phenomenon of different development speeds that, at various scales, marked and still mark the inequalities between North from South, in a sort of "fractal" pattern replicating in space and time.

CONVENERS: Alessio Argentieri (Città metropolitana di Roma Capitale) [a.argentieri@cittametropolitanaroma.it], Rossella De Ceglie (Università di Bari), Paolo Macini (Università di Bologna), Marco Pantaloni (ISPRA), Carla Petrocelli (Università di Bari)

Geoitaliani Project, history of geosciences, science outreach, sustainable development

T18. Field and digital geological mapping: the numerous facets of CARG project from crystalline basement to sedimentary deposits

Geological fieldwork is the starting point for geological reconstruction and final working out of any geological map. The integration with stratigraphy, structural and microstructural geology, petrology, geochemistry and geochronology is a useful tool for reconstructing geological framework and its evolution. The improvement of technology in marine surveys and recent availability of large databases for submarine regions stimulated the interest in implementing official geological maps in marine areas. Geological fieldwork can strongly benefit from the 3D perspective and their integration can help to overcome the existing limitations of map production.

This session aims to collect contributions dealing with fieldwork mapping with an eye focused on the renewed funding of the official geological mapping project of Italy at 1:50,000 scale (CARG Project), discussing new data, stratigraphic studies and interpretations for Mediterranean continental to volcanoclastic, shallow and deep marine deposits as well as crystalline rocks, structural and microstructural data and analyses.

Scientific contributions would be addressed, but not be limited, to i) sedimentary, tectono-stratigraphic and tectono-metamorphic evolution of Palaeozoic-to-Cenozoic orogen and evolution of Quaternary basins from regional to local-scale; ii) morphodynamic, depositional and tectonic processes in marine areas; iii) new methodologies of collection, storage and restitution of field data and 3D map visualizations.

CONVENERS: Laura Tomassetti (ISPRA) [laura.tomassetti@isprambiente.it], Attilio Sulli (Università di Palermo), Diego Pieruccioni (ISPRA)

Geological maps; sedimentology; stratigraphy; structural geology; marine geology; morpho-bathymetry; 3D perspective; crystalline basement

T19. Geomorphological and historical analysis as a research tool for the identification of geo-hydrological risk prone-areas

Geohydrological processes are common and widespread phenomena. Recent decades have seen an increase in intense and short-duration rainfall events caused by global warming, which in the Mediterranean area is manifested by an increase in air temperatures and changing in rainfall regime. Landslides, floods, and mud-debris flows, increasingly involve structures and infrastructure built in hazardous areas, such as those of fluvial pertinence or in landslide prone-areas, due to inadequate land use planning.
The evolution of geohydrological processes can be properly assessed in space and time through a solid knowledge base consisting of a large amount of information, among which historical documents (manuscripts, published and unpublished publications), as well as iconography (paintings, sketches, photographs) and historical cartography (geological maps and technical plans), capable of defining geomorphological dynamics and thus to add information in terms of hazard and risk, assume relevance. To these can be added particular historical records such as flood notches, marble plaques, and memorial stones that complement a special multi-temporal dataset on geo-hydrological processes. All this historical documentation, once selected, validated and properly interpreted on a scientific basis, can be organized in a database and used for land-use planning, event forecasting and proper geohydrological prevention.

CONVENERS: Francesco Faccini (Università degli Studi di Genova) [faccini@unige.it], Antonello Fiore (Società Italiana di Geologia Ambientale (SIGEA)- APS), Fabio Luino (CNR Torino), Stefania Nisio (ISPRA, Dipartimento per il Servizio Geologico d'Italia)

natural hazard, geo-hydrological processes, geomorphology, historical analysis, iconography

T20. Geomorphology in the Anthropocene: from human-landscape interaction to geoheritage management issues

Geoheritage sites are key component of the cultural heritage, closely linked to human activities that may undergo degradation as a result of anthropogenic pressure on the landscape. Indeed, their own genetic processes could be responsible of geoheritage degradation (i.e., fragility), but also external processes (i.e., vulnerability), being natural or human derived. This evolution may be particularly fastened also by changing climatic conditions. In detail, anthropic impact is able both to directly or indirectly modify and/or deplete and damage geoheritage. Modifications of the physical landscape can indeed derive from the human influence on surface processes dynamic, that may induce variations in the natural evolution rate of landforms, considered geoheritage sites when having a relevant scientific value. In very sensitive environments, then, landscapes and ecosystems are rapidly evolving in response to climate changes and the anthropic activities could be even more significative. This session seeks interdisciplinary contributes and specific case-studies that deploy various approaches and tools to investigate the human-landscape interaction, both in altering geomorphological process rates and landforms, and in mapping, promoting and managing geoheritage sites through innovative methodologies.

CONVENERS: Roberto Sergio Azzoni (Università degli Studi di Milano)
[robertosergio.azzoni@unimi.it], Pierluigi Brandolini (Università degli Studi di Genova)

Human geomorphology, geoheritage, vulnerability, Anthropocene

T21. Magnitude, rates, and timing of landscape evolution, and quantifying techniques

The interplay between endogenous and exogenous processes produces various landscapes on the Earth's surface. Tectonics, climate, surface processes, and human activities all leave their fingerprints on the topography, making it difficult for researchers to discriminate the contribution of each process in shaping the landscape. Furthermore, hillslope and fluvial dynamics develop in a setting intensely affected by Late Quaternary human activity and climate change.

This session aims to explore, in a broader perspective, the interaction and feedback among geomorphological and human-driven surface processes, climate, and tectonics occurring at different time scales.

We welcome studies that aim at quantifying the various aspects of an evolving topography adopting a multidisciplinary approach, thus including (but not limited to) techniques such as field-based analysis of geomorphic markers (e.g., terraces, paleo-shorelines, deltas, moraines, landslides), geochronological techniques (e.g., OSL, cosmogenic nuclides, thermochronology, radiocarbon dating), geodesy and remote sensing (e.g., GPS, UAV, and satellite imagery analyses), GIS-based and other geo-informatic techniques, and numerical landscape evolution modelling.

CONVENERS: Romano Clementucci (ETH Zurich) [rclementucci@erdw.ethz.ch], Luca Forti (Università di Milano), Michele Delchiaro (Sapienza Università di Roma), Silvia Crosetto (GFZ Potsdam)

Quantitative geomorphology; Topographic evolution; Geochronology; Remote Sensing

T22. The employment of space-based remote sensing technologies for monitoring surface dynamics and landscape evolution

Space-based remote sensing technologies are increasingly being applied for monitoring the dynamics of Earth surface. The continuous enhancing of technologies (multi-/hyperspectral sensors, Synthetic Aperture Radar-SAR), products (high and very high spectral and spatial resolution images, digital elevation models, etc.), techniques (photogrammetry, image processing, interferometry, visual inspection, thermal imaging, etc.) and tools (platforms and software for satellite data analysis and processing) contributes to providing valuable sources of information for observing landforms, understanding the processes that shape them and reconstructing landscape evolution. Such progress enables the development of innovative and applicative solutions based on integrated methodologies (multi-temporal change detection, modeling, machine learning, etc.) that improve downstream segment of the space system. The new italian and european IRIDE project reflects this scenery representing a great opportunity for fully exploiting the advancement of the satellite technology. The session welcomes contributions focusing on the employment of space-based remote sensing in the hydro-geomorphological investigation of surface phenomena, their interaction and their impact on landscape evolution. Applications are encouraged to cover, but not limited to, the monitoring of Earth surface changes through new quantitative approaches, data fusion methods and artificial intelligence-AI algorithms.

CONVENERS: Marina Zingaro (Università di Bari) [marina.zingaro@uniba.it], Vincenzo Massimi (Planetek Srl), Domenico Capolongo (Università di Bari)

satellite remote sensing, surface dynamics, geomorphology

T23. Analysis and management of coastal areas, from risk assessment to perspectives arising from new technologies.

Coastal areas are highly exposed to multiple natural and anthropic hazards. Risk in this environment is exacerbated by the ongoing global warming that triggers accelerated sea-level rise and changes in intensity and frequency of extreme meteorological events. In addition, approximately 80 percent of the world's coasts are rocky cliffs of varying heights, which are subject to collapse and erosion with a retreat rate that is generally not constant over time and varies depending on the rock masses features. Meeting these challenges and proficiently overseeing coastal cities and environments necessitates an increasing demand for advanced tools and technologies. In recent years, remote sensing, machine learning, deep learning and computer vision methodologies have gained increasing attention in various fields of research, including studies in coastal environment. This session welcomes contributions focusing on: a) modelling approaches for coastal risk assessment, b) influence of coastal dynamics on coastal infrastructures, c) multi-risk assessment of the coastal zone, d) the impact of erosion, flooding, and salinization on natural environments, infrastructures, socioeconomic assets and heritage sites, e) application of innovative techniques of Artificial Intelligence (AI) for the analyses of data collected in coastal area, f) development of new techniques of remote survey and sensing for coastal environment

CONVENERS: Giovanni Scicchitano (Università di Bari) [giovanni.scicchitano@uniba.it]

coastal areas, coastal hazard and vulnerability, coastal geomorphology, sea level rise, Artificial Intelligence, coastal monitoring, remote sensing

T24. Geomaterials for a Sustainable Development

In recent decades, both governmental entities and private enterprises have underlined the need for a green transition towards a more sustainable and resource-efficient society, because of this the innovations in the design and production of advanced geomaterials have become critical for the development of a new type of industry rooted in the circular economic framework. This session is open to contributions concerning (but not limited to) the current state of the art, characterization, and existing or potential applications of geomaterials such as cementitious materials, zeolites, geopolymers, ceramics, layer minerals, inert aggregates and pozzolans, mining and building wastes, ashes, LDHs, and more. The interdisciplinary nature of this session spans mineralogy, petrography, mining, inorganic chemistry, materials and environmental engineering and circular management. Contributions of researchers at all stages of their academic careers are welcomed, especially young Ph.D. students and postdoctoral researchers, aiming to provide a platform for enhancing visibility within the Italian scientific community.

CONVENERS: Davide Comboni (Università degli studi di Milano) [davide.comboni@unimi.it], Marina Clausi (Università degli Studi di Bari "Aldo Moro"), Roberta Occhipinti (Università degli Studi di Catania), Claudio Finocchiaro (Università degli Studi di Catania), Stefano Columbu (Università di Cagliari), Concetta Rispoli (Università degli studi di Napoli Federico II)

geomaterials, circular economy

T25. Advanced minero-chemical characterization and processing of waste for a conscious reuse

Global waste management and treatment are of paramount importance and, as regulated by the latest EU directives, are dependent on waste chemical compositions, physical characteristics, size, organic contents, behavior, and bioavailability of leachable and volatile components, and, last but not least, the way the waste is produced. Recent anthropogenic material research targets many waste categories, from seemingly sterile to eventually metal-rich, such as construction and demolition waste, incineration waste, air pollution control residues, production sludge, e-waste, mining waste, etc.
Given the heterogeneous nature of the waste, a detailed chemical-mineralogical characterization along with geochemical and petrological investigations, including element mobility and leaching behavior, mineral assemblages, and phase interaction, are crucial. Advanced techniques are required, such as high-performance microscopy, spectroscopy and chemo-mineralogy, synchrotron-based observations, and other assays (geotechnical, biological), which are essential for conscious treatment and reuse of waste, in a circularly economy perspective: as filler in bituminous mixtures, concrete, glass-ceramics, geopolymers, extraction of purified metals or other by-products, without additional harm to the environment and the health of living organisms.
This session aims at collecting research contributions dealing with innovative and multidisciplinary works which offer a deep knowledge of waste for a more sustainable reuse.

CONVENERS: Paola Stabile (Università degli studi di Genova) [paola.stabile@unicam.it], Azzurra Zucchini (Università degli studi di Perugia), Francesco Radica (Università degli Studi G. d'Annunzio Chieti – Pescara), Luciana Mantovani (Università degli studi di Parma), Valerio Funari (CNR Napoli)

geochemistry, mineralogy, waste valorisation

T26. Geosciences for the characterization, exploration and exploitation of primary and secondary mineral resources

Present and future challenges, such as the green energy transition, are producing a major change in the economic balance of the world. The importance of raw materials that sustain the leading industrial branches implied in the change of paradigm has risen.
As a result, the European Commission has addressed its attention to raw materials (e.g., REE, Li, Ta, W) which are employed in a wide set of necessary technologies and whose production is monopolized outside Europe. These materials are classified as critical and strategic due to their supply risk and geopolitical implications. The Critical Raw Materials Act has been recently conceived to ensure a secure and sustainable supply also improving the knowledge on mineral resources of member countries. Therefore, geologists have to tackle this challenge due to their unique ability to identify, characterize, categorize and evaluate the economic potential of mineral deposits and mine wastes.
This session encourages researchers and professional geologists to submit contributions dealing with the investigation of primary and secondary mineral deposits located in Italy or elsewhere, conducted through approaches and techniques ranging from structural geology, mineralogy, geochemistry, thermodynamics, and geophysics, also applied to circularity for evaluation, valorisation, and exploitation of modern and historical mining wastes.

CONVENERS: Simone Vezzoni (Consiglio Nazionale delle Ricerche) [simone.vezzoni@igg.cnr.it], Matteo Deidda (Università degli Studi di Cagliari), Giovanni Grieco (Università degli Studi di Milano Statale), Nicola Mondillo (Università degli Studi di Napoli Federico II), Valentina Rimondi (Università degli Studi di Firenze)

Raw materials, Strategic resources, Ore minerals and deposits

T27. Environmental mineralogy and sustainable development

Environmental mineralogy investigates the risk and environmental impact of natural and synthetic mineral species thus covering a broad interdisciplinary field ranging from mineralogy to geochemistry including geology, biology, ecotoxicology, and industrial waste management. This session is focused on recent research activities dealing with minerals of environmental concern without excluding fibrous and tubular minerals as well as waste management. It will include environmental risk assessment, comprising release, diffusion, and targeting as well as remediation and rehabilitation studies. The session will also provide a forum to promote a discussion on the roleminerals play in solving environmental problems (e.g. toxic organic and inorganic elements immobilization) as well as their applications in medicine and pharmacy. Contributions analyzing the effects on human health are also welcome.

CONVENERS: Roberto Buccione (Università della Basilicata) [roberto.buccione@unibas.it], Sonia Conte (CNR - ISSMC), Riccardo Fantini (Università di Modena e Reggio Emilia), Giancarlo Capitani (Università di Milano Bicocca), Michela Sturini (Università di Pavia), Maura Mancinelli (Università di Ferrara)

environmental mineralogy; mineral resources, waste recovery and valorization; environmental impact

T28. High-resolution chemical and textural imaging techniques as analytical tools in Earth Sciences

Improving the visualization of objects is mandatory in Geology where the description of morphological, as well as chemical, mineralogical and physical features of samples is needed. The scientific study of rocks started with the advent of the polarizing microscope while a second major step coincided with the development of SEM and TEM techniques. During the last decades imaging tools based on spectroscopies have accelerated our possibility to study with an unprecedented resolution fossils minerals and rocks. Fast computers nowadays allow creating 2D and 3D images from arrays of analytical points providing accurate and high-resolution textural representations and distributions of chemical elements, trace to ultra-trace constituents, isotopes, oxidation states, porosities etc. Very recently, the in-house availability of 3D techniques like tomography, traditionally restricted to large-scale facilities, has provided a significant impetus to the spatial analysis for applications from structural Geology to ore Mineralogy, Cultural Heritage, Biomineralogy, etc.
This session aims at bringing together all scientists working with the improvements of imaging methods and is open to any type of technique for any application. We believe that, considering the availability of novel technologies and computational methods, the use of these tools for solving specifical issues in Geology is only limited by fantasy.

CONVENERS: Giancarlo Della Ventura (Università di Roma Tre) [giancarlo.dellaventura@uniroma3.it], Simone Bernardini (Università di Roma Tre), Cecilia Viti (Università di Siena), Federico Lucci (Università di Bari), Giovanna Agrosì (Università di Bari)

Imaging, spectroscopic techniques, geological samples, elemental distribution

T29. Mineralogy behind Earth processes: insights from the atomic to the macroscopic scale

Minerals may record geochemical, geological and ore-forming processes as they respond to the geological evolution of their host rocks. Minerals are also the source of metals and/or raw materials on which our society relies. At the same time, the increased capabilities of current analytical techniques in terms of spatial resolution, sensitivity and precision allow us to delve deeper into the crystal chemistry of minerals from the nano- to the micro-scale. In particular, mineralogical crystallography is fundamental to better define crystal-structure complexity, structure-property relationships of minerals and their synthetic analogues, to describe mineral evolution under non ambient conditions, to discover new mineral species and to improve mineral taxonomy.
The session welcomes contributions from experimental and theoretical studies related to all the above topics, as well as mineral nomenclature and classification.

CONVENERS: Sabrina Nazzareni (Università di Parma) [sabrina.nazzareni@unipr.it], Maria Lacalamita (Università di Bari), Matteo Ardit (Università di Ferrara), Giorgia Confalonieri (Sapienza Università di Roma), Marta Morana (Università di Firenze)

Minerals, crystal-structure complexity, non ambient conditions, new mineral, synthetic analogues

T30. The science of clays and zeolites: from genesis to sustainable applications

Clay and zeolites minerals can contribute to achieve the ambitious goals of the European Green Deal, representing a clear response to global challenges related to broad fields of applications for industry, environment, hydrogeological risk and more. These minerals are of great interest for geosciences. Clays are the most diffuse sediments on the Earth crust, and they have a fundamental role in understanding paleoclimate, sedimentary environments, and diagenetic processes. Moreover, as zeolites, they represent a useful tool providing information on hydrothermal system and very low grade metamorphism. Thanks to their extreme sensitivity, clays and zeolites find application in high-value technological uses by exploiting ion exchange and selective adsorption of organic molecules such as the sequestration of undesirable substances (included that of emerging concern) from aqueous, solid, and gaseous phases. Furthermore, they represent important sources of raw materials in several industrial productions as ceramic and construction materials.
This session is open to studies highlighting the important contribution of these minerals in geoscience, their crystal chemistry and genesis, as well as their applications in wastewater treatment, environmental remediation and soil reclamation, landslides studies, hydrogeological risk, in the production of ceramic and more.

CONVENERS: Francesco Cavalcante (CNR) [francesco.cavalcante@cnr.it], Francesco Izzo (Università di Napoli Federico II), Mariano Mercurio (Università degli Studi del Sannio), Daniela Pinto (Università di Bari), Claudia Vitone (Politecnico di Bari), Chiara Zanelli (CNR)

clay minerals, zeolites, genesis, geosciences, industry, sustainability

T31. Assessing and mitigating natural risks: the role of geology

The Italian landscape is shaped by the combined activity of earthquakes, volcanoes, floods and landslides. These phenomena and the hazards they pose are natural and are all manifestations of the youthfulness of Italian geology. Moreover, these four hazards are also strongly interconnected, e.g. as cascading events, and therefore must be addressed with a multi-hazard approach.
They have something in common also from the point of view of the associated risks and of their public perception.
Some of these hazards affect the same regions, the vulnerability and exposure of which are quite known and can be modified by the occurrence of the related hazardous events. This implies that geology can contribute to disaster risk reduction and mitigation in a multi risk perspective, in particular in the prevention field. Remarkably, the lack of prevention implies that – albeit with some notable exceptions – the risks associated with these phenomena have been steadily escalating, rather than decreasing.
The session aims to demonstrate that all adverse natural phenomen affecting Italy are the result of the same geological evolution, and that the contribution of Geology to risk prevention should evolve towards a more quantitative, multidisciplinary, multi-hazard and opern-minded approach.

CONVENERS: Antonello Fiore (SIGEA-APS) [presidente@sigeaweb.it], Maria Luisa Carapezza (INGV), Daniela Di Bucci (Dipartimento della Protezione Civile), Carla Iadanza (ISPRA), Tommaso Moramarco (CNR)

Geohazards, earthquakes, volcanoes, floods, landslides, prevention

T32. Citizen Science for risk reduction strategies and sustainable management

Citizen Science is the active involvement of citizens in the collection, analysis and interpretation of data for scientific purposes. Participatory activities are changing the way society can interact with science, actively encouraging the development of new knowledge and promoting the growth of informed and aware societies. In this context, the session aims to collect contributions for a constructive exchange on the topic of collaboration in the field of Geosciences, with a focus on risk reduction strategies and sustainable management.
Citizen science for disaster risk reduction (DRR) could be a successful tool in providing early warning of hazards and contributing to emergency planning. The application of a Citizen Science approach in risk reduction strategies aims to build scientific skills also taking into account citizen responsibility and the most vulnerable at disaster risk.
Moreover, the role of participatory activities could play a significant role in monitoring and implementing the United Nations Sustainable Development Goals (SDGs) bringing to social development and action transformation.
We invite authors to present experiences, approaches and tools for participatory activities, also presenting datasets, portals or open tools for data collection. We are interested in case studies and existing projects of Citizen Science that contribute to achieve risk reduction and the SDGs at local, regional and national level.

CONVENERS: Isabella Lapietra (Università degli Studi di Bari) [isabella.lapietra@uniba.it], Laura Criscuolo (IGG-CNR Pisa), Alessandro Sarretta (IRPI-CNR Padova)

Citizen Science, participatory activity, disaster risk reduction, Sustainable Development Goals

T33. Guidelines and perspectives of seismic microzonation in Italy: from geothematic cartography to numerical modelling

In the last 15 years, following the publication of the "Indirizzi e criteri per la Microzonazione Sismica" (Guidelines and Criteria for Seismic Microzonation) by the Seismic Microzonation Working Group of the Conference of Regions and Autonomous Provinces of Italy and by the Italian Civil Protection Department (ICPD), the information content and quality requirements, as well as the standardization of the requested products have undergone numerous changes and updates, also considering the developments in seismic hazard studies in other countries. This may not be surprising considering the presence of very different geologic and seismotectonic settings in Italy, as well also worldwide, which complicates the generation of seismic hazard maps at local scales, within territories ideally divided into zones with homogeneous seismic response.

We propose this session as a public forum to promote a broad discussion on the merits, critical issues and perspectives of possible further updates of the investigation methods, reporting procedures and product requirements, as defined in the Italian Guidelines and Standards for Seismic Microzonation by the Technical Committee for the support and monitoring of Seismic Microzonation of the ICPD. .

We encourage contributions that illustrate practical experiences and challenges arising from regional- to local-scale case studies, with reference to the implementation of the different levels of seismic microzonation studies (level 1, level 2, level 3). In particular, we invite the presentation of the staged outcomes of the studies and the discussion of their possible improvements, including geothematic maps, geophysical and geotechnical investigations, as well numerical modelling of both local seismic response and expected co-seismic ground instabilities.

CONVENERS: Vincenzo Del Gaudio (Università degli Studi di Bari "Aldo Moro") [vincenzo.delgaudio@uniba.it], Salvatore Gallicchio (Università degli Studi di Bari “Aldo Moro”), Silvia Giallini (CNR) , Floriana Pergalani (Politecnico di Milano) , Janusz Wasowski (CNR)

seismic hazard, seismic microzonation, geothematic maps, site effects, local seismic response

T34. Landslide monitoring, modelling, and prediction: bridging new tools and data to the “slope-failure model” perspective

Landslide monitoring, modeling, and prediction are complex tasks that need different types of good data and reliable analytical tools. Slope-scale, physically-based landslide modeling requires detailed morphological, hydrogeological, and geotechnical measurements; regional-scale, statistical analyses rely on a significant amount of typically proxied data, with high spatial and temporal accuracy.
Recently, emerging modelling methods and survey technologies solve all these requirements with more and more complex/specific applications. However, in front of the incredible easiness with which direct access to sophisticated experimental and analytical tools is nowadays given to any researcher, sometimes the “geological facts” run the risk of being blurred up to a disconnection between field reality and representation.
Field and remote surveys are often affected by a weak knowledge of their real physical coupling to the studied slope failure phenomena. At the same time, few efforts are devoted to critically investigate the adopted stochastic approach (mapping units, proxied data and validation strategies).
Contributions addressing data collection and management at different scales are welcome, as well as discussions on the definition of standards for data collection and storage. At the same time, contributions are encouraged investigating the key issues for landslide hazard modelling (where, why, when, how big and how fast and far).

CONVENERS: Edoardo Rotigliano (Università degli Studi di Palermo) [edoardo.rotigliano@unipa.it], Margherita Bufalini (Università degli Studi di Camerino), Stefano Luigi Gariano (CNR-IRPI, Perugia), Luigi Guerriero (Università degli Studi di Napoli Federico II), Claudia Meisina (Università degli Studi di Pavia), Mario Parise (Università degli Studi di Bari)

landslides, database, inventory, variables, modelling

T35. Multihazard investigation, assessment and mapping techniques in urban areas

Uncontrolled urban growth resulting from rapid population increase, combined with inadequate land planning and a lack of local authorities enforcing building standards, contributes to the increased vulnerability of populations in urban areas. Urban environments experience a process of "accumulation and amplification of multiple geo-hazards" caused by human activity, which increases the susceptibility of urban areas to various geological risks. The United Nations Development Programme (2021) emphasizes the significance of integrating urban geohazard reduction with national risk reduction efforts.

The risk assessment in urban areas often involves the qualitative and/or quantitative evaluation of many geological hazards, determined by combining the hazard's impact value with the vulnerability of the urban environment. Although in metropolitan areas the uncertainty of geodata sometimes prevents the quantitative resolution of this issue, most researchers agree that the combination of multiple geo-hazard maps with maps of urban environmental vulnerability represents the optimal solution.

This session aims to provide an overview of the tools and methods for multi-scale analysis that allow for the evaluation, including combined evaluation, of geo-risks in urban areas. The contributions may present: new experiments, applications of already established methods and tools, examples of best practices in hazard analysis, risk assessment (multi-risk), and land use planning.

CONVENERS: Giancarlo Ciotoli (CNR) [giancarlo.ciotoli@cnr.it], Iolanda Gaudiosi (CNR), Federico Mori (CNR), Massimiliano Moscatelli (CNR), Stefania Nisio (ISPRA)

Geological, hydrological, geochemical hazards; (multi)-hazard assessment; mapping techniques; best practices; land use planning

T36. Sinkholes vs. land subsidence: assessment of the geological hazards and impacts on environment and society

Sinkholes represent a subtle geological hazard, often occurring without any precursory sign and characterized by high rapidity. These characteristics make them extremely dangerous, and a potential source of significant risks to society.
Land subsidence affects many of the world's major river deltas and alluvial coastal plains, inducing consequences such as aquifer salinization, inundation of lowlands, and coastal erosion. It is driven by tectonics, reduced fluvial sediment supply, sediment auto-compaction, and volcanism, in addition to anthropogenic causes, like subsurface fluid extraction.
The session intends to explore the recent advancements on natural and anthropogenic sinkholes, as well as on land subsidence in coastal plains, focusing on the understanding of how different factors contribute to these processes. Contributions dealing with multi-disciplinary approaches to single case studies, regional mapping and modelling are particularly encouraged, as they provide the basis for sustainable management practices.

CONVENERS: Mario Parise (Università Aldo Moro, Bari) [mario.parise@uniba.it], Luigi Bruno (Università di Modena), Diego Di Martire (Università Federico II, Napoli), Isabella Serena Liso (Università Aldo Moro, Bari), Daniela Ruberti (Università della Campania Vanvitelli, Aversa), Pietro Teatini (Università di Padova), Luca Zini (Università di Trieste)

Sinkholes; land subsidence; vulnerability; hazard; plains; urban areas

T37. Understanding the Campi Flegrei magmatic-hydrothermal system and its time changes

The session is focused on the contributions of different geosciences to understand the on-going phenomena affecting Campi Flegrei and the past history of the region, with the aim to make predictions on future scenarios of the local magmatic-hydrothermal system, also considering the possible interference of external factors, such as the occurrence of regional earthquakes and the input of fresh magma in the deep reservoir.
To this purpose, the development of conceptual and numerical models based on the contributions of different geoscientific disciplines is mandatory. For example, the time-changes in the temperatures and fluid pressures of the different aquifers could be used (1) to calibrate the numerical models for simulating the coupled transport of fluids and heat in the porous and fractured media present at depth, and (2) to predict the rheological behavior of relevant rocks in the system of interest.
Nevertheless, the task of the scientific community does not end with the short-term management of emergencies, as in the current case. In fact, decision makers must understand that the time scale of the bradyseism requires to implement suitable long-term actions on buildings and human works in general to make it possible to live in the Campi Flegrei.

CONVENERS: Matteo Lelli (CNR Pisa) [m.lelli@igg.cnr.it], Stefano Caliro (INGV Napoli), Giovanni Chiodini (INGV Bologna), Luigi Marini (STEAM srl, Pisa), Claudia Principe (CNR Pisa - INGV Napoli)

Campi Flegrei; Magmatic-hydrothermal system; Bradyseism; Volcanic surveillance

T38. Urban developments and natural risks

Human beings have strongly influenced the morphology of territories, leaving their indelible mark and often creating the conditions for severe disruptions and exposure to conditions of high vulnerability. The landscapes have changed over the years, sometimes distorted, and substantial modifications such as overbuilding and diversions of water courses, constructions on poor-quality materials, abandonment of terraces, etc., have increased the risks for the population following phenomena such as earthquakes, volcanic eruptions, landslides or floods. In this multidisciplinary session, we would like to collect contributions and insights to reflect on the relationship between human beings and the environment, the culture of prevention and protection of the territory, and how to make citizens more aware of the correct land use.

CONVENERS: Giovanna Piangiamore (INGV) [giovanna.piangiamore@ingv.it], Maria Grazia Ciaccio (INGV), Gaia Soldati (INGV), Stefano Solarino (INGV), Alessandra Maramai (INGV)

urbanization, natural disaster, culture and risk

T39. Wildfires, erosion and landslides in burned areas

Steep mountain slopes affected by wildfires are prone to increase in erosional processes, shallow landslides, and rock falls compared to unburned conditions. The initiation mechanisms of these processes depend on a combination of hydrologic, geomorphic, geotechnical and meteorological factors that require complex approaches to be accurately assessed. In-situ investigations, soil testing and monitoring activities are of primary importance to understand how mass movements can activate and progress through the hillslopes. Robust sets of data are therefore necessary to implement numerical models aimed at analyzing their behavior and evolution in space and time. The likely relationship with burn severity represents a challenging task that provides a valuable chance to perform multi-disciplinary studies with experts in forest sciences and fire ecology. In the light of this, new spaceborne and UAV-based technologies are providing unprecedented supports in the analysis of both vegetation and soil conditions after wildfires.
This session encourages contributions aimed at improving the current knowledge on post-fire hydrologic and geomorphic hazards, as well as advanced methodologies to better forecast their initiation and evolution in the so-called window of disturbance. Case studies based on the integration of multi-disciplinary data or techniques are also welcome.

CONVENERS: Giuseppe Esposito (CNR IRPI, Perugia) [giuseppe.esposito@irpi.cnr.it], Giuseppe Mandrone (Università di Torino), Mario Parise (Università Aldo Moro, Bari), Dario Peduto (Università di Salerno)

wildfires, erosion, landslides, soil

T40. Building with Nature: from river corridors to coastlines

In the last decades new key concepts of resilience have become dominant in the context of environmental management, especially the Building with Nature strategies, that combine natural and anthropic components for the benefit of the society and natural systems. Nature based Solutions (NbS) implemented using, e.g., marshes, mangroves, dunes, or shellfish reefs could improve coastal environments and contribute to shores' protection thanks to their ability to reduce storm waves, storm surges, and to keep pace with sea-level rise. In riverine systems, natural flood management measures can reduce the rate/amount of runoff and improve the ability of floodplains to reduce flood impacts. NbS are also applied in deltaic systems. These solutions should be prioritised over traditional approaches that often generate drawbacks and lead to environmental degradation, interfere with natural dynamics, jeopardising natural systems and increasing the impact of storm events. The proposed session aims at collecting studies related to green solutions in riverine and coastal systems, which combine diverse approaches including geomorphology, Earth Observation and modelling, biogeosciences, natural hazards and risks, etc. The presentations should focus on the advantage of utilising NbS in contrast with traditional grey interventions.

CONVENERS: Riccardo Brunetta (Università di Ferrara) [brnrcr1@unife.it], Clara Armaroli (Università di Bologna), Luca Mao (University of Lincoln UK)

Nature-based Solutions, green infrastructures, river management, coastal management, flood hazard, risk mitigation, restoration projects, managed realignment, natural flood management

T41. Caves, mines and other underground spaces as field laboratories in environmental geology

Natural and artificial underground spaces represent some of the top challenging continental environments of the Planet. Despite many significant obstacles to overcome, underground voids are among the most important sources of information on the Earth's Critical Zones from a multidisciplinary perspective. These places have particular relevance in environmental geology researches as field laboratories both to understand the Earth's processes and the climatic changes, and to face several problems related to anthropic pressures and modification.
This session aims to provide a broad yet thorough review of updated investigations and innovative studies within caves, mines and other underground spaces that offer insights about the multiple processes of interest to environmental geology. These include contributions and case studies from basic and applied research to (1) knowledge of various geological phenomena that have repercussions on the subterranean environment and its associated risks (pollution, exceptional meteorological events, earthquakes, stability, health, etc.), (2) development of monitoring systems for environmental impact assessment and its mitigation strategies (traditional techniques and modern IT systems), and (3) exploration of criteria and integrate methods that provide cognitive elements for a sustainable use of these georesources.
This session is sponsored by the Sezione di Geologia Ambientale – SGI

CONVENERS: Laura Sanna (CNR) [laura.sanna@cnr.it], Valentina Balestra (Politecnico di Torino), Isabella Serena Liso (Università degli Studi di Bari Aldo Moro), Mario Parise (Università degli Studi di Bari Aldo Moro), Bartolomeo Vigna (Politecnico di Torino)

underground monitoring; environmental impact; sustainable development; environmental assessment; cave management

T42. Digital transition of multiscale geological datasets from satellite imagery to microscale investigations

The digital transition of spatial information is one of the most challenging aims in the framework of international innovative strategies (e.g., Bernard et al., 2005; Maguire and Longley, 2005). The increasingly widespread use of satellite images, aerial photos, topographies, and thematic maps in digital format, integrated by more or less performing apps with increasingly detailed local information datasets (e.g., information on cultural heritage, naturalistic and landscape interest sites, petrological investigations, correlative microscopy, etc.), are opening a new way of perceiving the territory and integrating some augmented reality restitution with field and laboratory investigations. Most of the thematic cartography, indeed, can now be truly catalogued numerically through well-defined sharing protocols (e.g. Open Geospatial Consortium - OGC, INfrastructure for SPatial InfoRmation in Europe – INSPIRE). Such geodatabases are ready to be used, in turn, for further multiple uses if FAIR (i.e. Findable – Accessible – Interoperable - Reusable). All contributions in the widest range of geosciences that seek to make interactive multi-scalar and multi-source data quantitatively, are welcome to be considered for this session. This is done to provide innovative techniques for the management, planning, observation, and study of geological features in an interoperable key.

CONVENERS: Gaetano Ortolano (Università di Catania) [gaetano.ortolano@unict.it], Pietro Mosca (CNR) , Michele Zucali (Università di Milano Statale)

FAIR; Interoperability; UAV survey; Quantitative meso- to micro-structural analysis; Quantitative petrology

T43. Experiences of data sharing and use in the frame of Research Data Infrastructures

Research Data Infrastructures (RDIs) play an important role for the adoption of the Open Science paradigm and the FAIR (Findable, Accessible, Interoperable, and Reusable) data principles.
At the European level there are already many disciplinary-specific RDIs such as EPOS and EMSO ERICs, and support to the establishment of a data ecosystem is guaranteed by many dedicated projects, many closely linked to the European Open Science Cloud (EOSC). The National Recovery and Resilience Plan (PNRR) funds projects such as GeoSciences and MEET to help develop robust RDIs in Italy too.
RDIs manage and share research products following international standards, not only data, but also tools supporting researchers in the data management and collaborative analysis. RDIs cover the entire data lifecycle and so they require dedicated policies and workflows.
The updating of data, metadata, interoperable services, software, and related documentation needs considerable effort and requires the involvement of new profiles such as data managers, data stewards, and data analysts. Furthermore, dissemination to various stakeholders, including citizens, is crucial for their involvement and support.
Researchers are invited to describe experiences on sharing and use of data, metadata, interoperable services, tools, software, and documentation adopting well-established open standard.

CONVENERS: Maria Pia Congi (ISPRA Roma) [mariapia.congi@isprambiente.it], Mario Locati (INGV Milano)

FAIR, RDI, GeoSciences, MEET,EPOS, EOSC, data, metadata, PNRR, standards, infrastructures,

T44. Geological storage for energy transition: concepts, methods, modelling and applications

The storage of energy and carbon dioxide in subsurface geological formations plays a crucial role to reach international agreement and to tackle climate change. Geological storage will strongly contribute in transitioning to decarbonized activities, such as relying on renewable energy sources, low and zero-carbon power and industry, and heat generation. The suitability of storage sites relies on the characteristics, capacity and integrity of the reservoir and sealing intervals under various factors, including thermal, mechanical, hydraulic, and chemical stresses. Ensuring secure subsurface storage necessitates expertise in geology and geosciences, as well as thorough risk assessments to successfully gain public acceptance and increase the deployment of projects. This session aims to facilitate interdisciplinary discussions among different areas of expertise related to geological storage, covering energy and CO2 storage in geological reservoirs, from laboratory experiments to large-scale projects. Contributions from individual studies integrating elements across the entire storage process alongside field projects focused specifically on geological storage are encouraged for their potential contribution towards achieving a low-carbon future.

CONVENERS: Mattia De Luca (Università degli Studi G. d'Annunzio di Chieti-Pescara) [mattia.deluca@unich.it], Vittorio Scisciani (Università degli Studi G. d'Annunzio di Chieti-Pescara), Paolo Mancinelli (Università degli Studi di Perugia), Sabina Bigi (Sapienza Università di Roma),

Energy transition; energy storage; geological storage; CO2; hydrogen; CCS; CCUS.

T45. Numerical modelling of Earth processes and risks: methodologies and perspectives for quantitative insights in the understanding of the phenomena

Our Planet is a dynamic place, with changes occurring on highly variable timescales, ranging from the sudden onset of landslides, earthquakes, or volcanic eruptions to the gradual reshaping of coastlines, mountains, and sedimentary basins over geologic time. To understand the broad range of physical processes in the Earth system, the use of numerical models with varying complexities and computational requirements is increasingly widespread.
Recent advancements in high-powered computing have led to models capable of finer spatial and temporal resolutions, including multi-physical processes, thus better representing the dynamic natural environment. Developing such numerical models is highly challenging, as many environmental processes have unique features and exhibit significant spatial variability. Consequently, the growing need to quantify uncertainty in model outputs, along with the rapid increase in the volume and variety of 'big data', has led to more complex datasets. These datasets are crucial for scientists, model users, and decision makers to answer key questions, prompting the development of workflows for integrating numerical models and processing their outputs.
This session invites contributions on physically-based numerical models of natural phenomena for more effective multi-hazard and risk assessments. These assessments are crucial for mitigating catastrophic impacts on human lives, as well as on structures and infrastructures. We strongly encourage submissions involving numerical models of theoretical problems, parametric analyses, and specific applications in case studies of Earth-related processes and natural hazards. Contributions on the development of workflows for managing numerical models and their outputs are also highly welcomed.

CONVENERS: Silvia Massaro (Università di Bari) [silvia.massaro@uniba.it], Piernicola Lollino (Università di Bari), Manuel Stocchi (Università di Bari), Nunzio Luciano Fazio (Consiglio Nazionale delle Ricerche)

Earth processes, numerical modelling, natural risks

T46. Geosciences revamp and sustainable planning strategies: multidisciplinarity is the way

Worldwide, under the ongoing pressure of climate change, earth and environmental scientists are facing increasingly challenging problems due to the overexploitation of natural resources, land consumption, overpopulation and pollution (in all its forms). Earth and environmental sciences play a major role in terms of mitigation risk strategies, land and soil regulation. Despite policy gaps and useless communication, environmental scientists should be really involved in the planning of the sustainable management of our planet. To better understand the complexity of geological phenomena and constrain potential impacts due to human activities, the most effective studies rely upon a multidisciplinary approach. The virtuous collaboration of different geological and environmental disciplines may reasonably solve the current impasse in environmental policies.
This session is open to researchers (also including PhD students) and specialists dealing with multifaceted case studies and approaches. We particularly encourage contributions planned as follows: i) site characterization (sedimentology, stratigraphy, geochemistry, etc..), ii) modelling (hydrogeological, geological, etc..) and iii) environmental monitoring (remote sensing etc..). Participants should document how cooperation between different branches of geosciences, but also contributions from additional disciplines (biology, physics, computer science etc...), may represent a powerful methodology to solve short-term goals and make solid long-term plans following the sustainability concept.

CONVENERS: Bruno Campo (Università di Bologna) [bruno.campo@unibo.it], Nicolas Greggio (Università di Bologna), Beatrice Maria Sole Giambastiani (Università di Bologna), Sonia Silvestri (Università di Bologna)

Multidisciplinarity; Environmental Geology; Multiproxy studies; Sustainable management

T47. Women in Geosciences: a journey through the social changes from the past to present and future scenarios

The expansion of public education in the twentieth century resulted in an increasing number of women obtaining professional geosciences qualifications even though employment opportunities were still limited. Compared to men, women are still underrepresented in geosciences and in the professional workforce due to multiple factors contributing to the disparity. Some of the key factors include historical gender bias and stereotypes which could have influenced perceptions about which studies are considered more suitable for men or women, especially regarding the STEM (Science, Technology, Engineering, and Mathematics) fields.

Geosciences, often associated with fieldwork and physical demands, may be subject to stereotyping that discourages women from pursuing careers in the field. Moreover, the workplace culture, family and work-life balance can exacerbate the perception that geosciences careers require significant time away from home, often resulting as a barrier for women.

In this session, we seek contributions that highlight (i) scientific and professional achievements by women in the past, (ii) the current status informed by quantitative data and (iii) future actions to empower the representation of women in geosciences. This includes creating more inclusive and supportive environments, promoting diversity in leadership roles, providing mentorship opportunities already starting from secondary schools, and challenging stereotypes and biases.

CONVENERS: Martina Zucchi (Università degli Studi di Bari Aldo Moro) [martina.zucchi@uniba.it], Roberto Braga (Università di Bologna), Sveva Corrado (Università Roma Tre), Daniela Di Bucci (Dipartimento della Protezione Civile Nazionale), Luisa Sabato (Università degli Studi di Bari Aldo Moro)

gender balance; women in science; STEM careers; call to action; diverse workforce

T48. The art of Geosciences communication

Despite the crucial role of Geosciences in shaping a more sustainable future for society and the planet, a critical question for geoscientists is how to communicate their contributions more effectively to advancing sustainable development across various sectors, from environmental challenges to geohazards and georesources. Moreover, European and national funding programs actively encourage scientists to engage the public in increasingly imaginative ways, addressing collective concerns and even involving the public in the scientific process itself.
Such issue encourages approaching Earth Sciences from different viewpoints, fostering a holistic understanding of our planet, while engaging a broader audience in the wonders of scientific exploration and creative expression.
The primary objective of this session is to involve geoscientists in presenting, discussing, and sharing best practices in effective geoscience communication, from data analysis to artistic expression.
Traditional communication methods, such as storytelling, language, and visualization, as well as emerging digital strategies like citizen science, social networks, and apps, will be considered.
Unconventional approaches, including visual arts, literature, comics, music, and performance to convey scientific information to the presentation of Earth Sciences inspired artistic works are welcome.
Contributions to the session will be evaluated for potential publication in a thematic special issue.

CONVENERS: Valeria Giampaolo (CNR) [valeria.giampaolo@cnr.it], Ortensia Amoroso (Università degli Studi di Salerno), Rosa Coluzzi (CNR), Giacomo Eramo (Università di Bari Aldo Moro), Marco Romano (Sapienza, Università di Roma), Anna Giamborino (APPI, Associazione Paleontologica e Paleoartisca Italiana)

Earth Sciences, visual arts, music, sonification, literature, comics, outreach, education, research, engagement, geoethics, Geo/environmental thinking, active learning

T49. Geosciences at school 2024

Climate change, sustainability, extreme events, georesources and critical minerals, soil exploitation, geological risks... These are just some of the major issues that our society must face on a daily basis but for which the population, at all levels, is often unprepared and incorrectly informed. This knowledge deficit has clear repercussions on the understanding of the concept of risk and the ability to consciously face the modern challenges of territory safeguarding and sustainable development. Geosciences are in fact essential in many key aspects of sustainability and are therefore necessary for achieving the objectives of the 2030 Agenda.
The role of the school is fundamental for the acquisition of knowledge, skills and competences for the training of citizens of the future. This session aims to be a moment of meeting and encouragement for researchers and teachers to work towards improving the dissemination of geological knowledge at school, through all traditional and innovative teaching and educational tools, with attention to inclusive teaching. Contributions, also in Italian, which illustrate experiences at school and results obtained are welcome, as well as activities carried out in the frame of the PLS project (Piano Lauree Scientifiche) and positive school-university-museum interactions. The publication of a volume of the *Rendiconti OnLine della Societa' Geologica Italiana (ROL-SGI)*, in the series "Le Geoscienze a Scuola", is planned.

CONVENERS: Francesca Cifelli (Università di Roma 3) [francesca.cifelli@uniroma3.it], Anna Gioncada (Università di Pisa), Claudia Lupi (Università di Pavia), Eleonora Paris (Università di Camerino), Elena Bonaccorsi (Università di Pisa)

T50. Fossil record, paleoenvironment and climate change throughout the Neogene and Quaternary Earth history

The Neogene and Quaternary Earth history is marked by significant global climate and environmental modifications that culminated in the Quaternary icehouse conditions. These diverse transient climate periods had profound impacts, of different rates and amplitudes, on faunal and floral assemblages. The investigation of these events is significant for the understanding of the interrelationships between ecosystem dynamics and climate change. This session is intended to bring together specialists in paleontology, paleoecology, paleoclimatology and paleoceanography, spanning from the Neogene to the Holocene. The aim is to share experience and results about the role of biota in highlighting climate transition and paleoenvironmental changes at different time scale, ranging from millions of years to decades. We welcome contributions ranging from both marine sediments, terrestrial records, geohistorical archives as well as multidisciplinary studies connecting the fossil record with independent information of environmental changes (organic and inorganic geochemistry, sedimentology and more). Ultimately, we intend to highlight how past records of biotic response to climate change can contribute to quantifying impacts of future climate change in the next decades.

CONVENERS: Patrizia Maiorano (Università di Bari) [patrizia.maiorano@uniba.it], Adele Bertini (Università di Firenze), Angela Girone (Università di Bari), Maria Marino (Università di Bari), Raffaele Sardella (Sapienza Università di Roma)

Paleoenvironment, climate change, marine and terrestrial fossil record, Neogene and Quaternary

T51. OPEN - Often Petrology Entails Novelties

Within geosciences, petrology remains a powerful and fundamental discipline for understanding how the solid Earth works. In the last decades, petrology has benefited from improvements in analytical and computational techniques that now provide unprecedented tools to unlock the time-integrated information preserved into rock-forming minerals and microstructures. Recently, petrology has been hybridised by aspects of chemistry and biology, revealing new insights into how life thrived on an inorganic rocky substrate.
This session is therefore OPEN to all the new results, discussions and ideas generated by metamorphic and igneous petrologists in their quest to understand the nature and evolution of Earth and planetary bodies. Studies on lithosphere evolution and differentiation, mountain building processes, chemical element cycles, genesis of ore deposits, fluid/melt production and transfer in the Earth's crust are some of the several topics that we seek to explore at all scales of investigation, from field-driven petrology to laboratory and computational petrology.

CONVENERS: Roberto Braga (Università di Bologna) [r.braga@unibo.it], Chiara Teresa Groppo (Università di Torino), Salvatore Iaccarino (Università di Torino)

Petrology, lithosphere evolution, orogenic processes, analytical techniques, computational methods

T52. Opening Pandora's box: inclusions in minerals

Sheltered within their host phases, inclusions preserve a wealth of geological information that would otherwise be lost due to the intricate history of rocks. Systems comprising hosts and inclusions document the processes and conditions present at the time of entrapment. Factors such as pressure, temperature, time, metasomatism, magma genesis, mineral solubility, mineral growth, redox processes, and mass and heat transfer can all be explored by examining inclusions within minerals. Recent advancements in technology and innovative methodological approaches have enhanced our ability to extract such information through careful microstructural, mineralogical, petrologic, and geochemical studies. Nevertheless, accurate interpretations of these records can only be achieved through synergies between fieldwork, the observation of natural samples, experiments, and computational modelling.
We invite contributions on any aspect of the expansive and varied field of inclusion studies in natural rocks from any geoscience discipline, spanning from sedimentary to metamorphic, from the depths of the mantle to volcanic rocks at the Earth's surface, including ore deposits. Specifically, we encourage discussions on data from solid, fluid, and melt inclusion studies, elastic geobarometry, petrological studies on inclusions, inclusion genesis, novel high-resolution techniques, and modelling of physical and chemical processes, as well as mineral behaviour in crucial geodynamic environments.

CONVENERS: Alessia Borghini (AGH University of Kraków - Poland) [borghini@agh.edu.pl]
Stefano Ghignone (Università di Torino), Mattia Gilio (University of Hamburg - Germany),
Emanuele Scaramuzzo (Università dell'Insubria), Matteo Alvaro (Università di Pavia)

Solid inclusions, melt and fluid inclusions, rock forming processes

T53. Origin and evolution of ophiolite suites and their mineralization: an interdisciplinary approach

Ophiolites are important sources of information on the genesis and evolution of the oceanic lithosphere, from active spreading centers to subduction zones.
They record igneous features essential to understand primary processes of the upper mantle and ocean crust, and are affected by fluid-rock interactions at multiple stages, contributing to the geochemical cycles of volatiles and other elements (CO_2 , H_2O, CH_4, Mg, Ca, etc…). Additionally, their meso- to micro-structural features are essential for paleogeographic and paleostructural interpretations and are useful tools to understand similar active geodynamic settings. Several economic ore deposits are also associated to ophiolitic sequences, such as chromitites, Platinum Group Elements (PGE) mineralization, volcanogenic massive sulfides and magnesite deposits.
This session seeks contributions addressing petrology, geochemistry, mineralogy and geotectonic evolution of ophiolite suites, including studies with a focus on ore formation.

CONVENERS: Micol Bussolesi (Università di Milano-Bicocca) [micol.bussolesi@unimib.it], Alessandra Montanini (Università di Parma), Alessandro Cavallo (Università di Milano-Bicocca), Francesca Claudia Rotondo (University of Southampton)

ophiolites, fluid-rock interaction, geochemical cycles, mineralization

T54. The evolution of the Earth's lithosphere: clues from mantle rocks, primary melts and crustal sections

The investigation of tectonically exposed mantle-to-crust sequences, xenoliths, and diamonds offers a unique glimpse into the composition and evolution of the Earth's lithosphere. Petrological and geochemical studies have unambiguously proven the heterogeneous nature of the lithospheric mantle in oceanic and continental (cratonic and off-cratonic) settings. The diverse architectural characteristics of the lithosphere arise from a complex interplay between processes as melt extraction, metasomatism/refertilization, and deformation. Field geology, petrology, geochemistry, HP-HT experiments, and thermodynamic modelling constitute essential and complementary tools for unraveling the nature and evolution of the Earth's lithosphere-asthenosphere system.

This session aims to integrate multidisciplinary studies that bridge micro-scale observations with large-scale geodynamic processes, with the primary goal of exploring i) the physicochemical state and dynamics of the upper mantle, ii) the genesis and transport of primitive melts to the surface, and iii) the cause and effects of melts/fluids infiltration, reaction and crystallisation throughout the lithosphere.

We welcome contributions focused on modern and fossil oceanic lithosphere analogues, orogenic peridotites, mantle-derived xenoliths and diamonds, primary mantle-derived magmas, and experimental samples.

CONVENERS: Carlotta Ferrando (DISTAV, Università di Genova) [carlotta.ferrando@unige.it], Arianna Secchiari (Università di Milano), Giulia Marras (Università di Roma La Sapienza), Federico Casetta (Università di Vienna)

Lithospheric mantle; Oceanic lithosphere; Ophiolites; Orogenic peridotites; Melt/fluid-rock reactions; Xenoliths; Metasomatism; Diamonds

T55. New frontiers of Planetary Geology

Planetary geology is expanding the boundaries of geosciences. With growing interests for the exploration of new celestial bodies and the preparation for human missions on the Moon and Mars the role of planetary geology is gaining momentum. From the geological characterization of landing sites for robotic missions to the study of planets habitability, the role of planetary geology became crucial in the last two decades. The aim of this session is to bring together disciplines as various as geology, geomorphology, geophysics, mineralogy, sedimentology, geomicrobiology and geochemistry and their contributions to planetary geology.
From the geomorphology and mineralogy of terrestrial planets to the study of planetary analogues on Earth, in this session we welcome all contributions aimed at supporting ongoing and future robotic missions, including ExoMars and Mars Sample Return missions. We welcome presentations on both past and present geological processes, either from mission's data or comparative planetary geology (including fieldwork on terrestrial analogues), either observations or modeling or laboratory experiments, meteorites characterization and space mining (or any combination of those).

CONVENERS: Fulvio Franchi (Università di Bari) [fulvio.franchi@uniba.it], Giovanna Agrosi (Università di Bari), Barbara Cavalazzi (Università di Bologna), Lucia Marinangeli (Università di Chieti-Pescara), Giovanni Pratesi (Università di Firenze)

Planetary Geology, terrestrial analogues, meteorites, terrestrial panets, astrobiology

T56. Challenges in the characterization of active faults: the contribution from seismology, geodesy, and structural analysis

Combining seismic, geodetic, and seismotectonic data enables a comprehensive and multidisciplinary approach to active fault identification. This integration enhances our ability to precisely locate active faults, determine their behavior, and estimate their future earthquake potential. The results of this study are crucial for seismic hazard assessment, land-use planning, and infrastructure design in earthquake-prone regions, contributing to the overall understanding and management of earthquake risks.
In this session, we would like to provide the opportunity to exchange new data and new approaches to characterize seismotectonic areas. We welcome contributions to describing Italian seismogenic fault through 3D geophysical reconstructions, advanced earthquake location catalogs, seismic and remote sensing source modeling, and paleoseismological and geomorphological studies.

CONVENERS: Maria Grazia Ciaccio (INGV) [mariagrazia.ciaccio@ingv.it], Lorenzo Petracchini (CNR-IGAG), Laura Scognamiglio (INGV), Marco Cuffaro (CNR Roma)

active faults, seismic hazard assessment, multidisciplinary approach

T57. Carbonate platform systems: records of palaeoenvironmental change

Marine carbonates respond to environmental changes by modifying skeletal associations and carbonate factories, changing facies character and spatial distribution. Hence, carbonate platforms are fundamental archives of changes in rate and mode of carbonate production, and of their controlling factors through geological time.
The architecture and depositional geometries of carbonate platforms are shaped by the interaction of production, sediment transport and deposition, and diagenetic processes: carbonate platforms thus respond to sea-level, environmental and climate changes, but in a complex way that makes challenging to extract palaeoenvironmental information. Furthermore, when looking at the geological past, modern analogues hardly apply to carbonate systems of the rock record.
Hence, the investigation of carbonate platforms increasingly requires a multi-disciplinary and multiscale approach, integrating sedimentology and stratigraphy with geochemistry and modelling. The geochemistry of carbonates is particularly informative: abiotic, microbial and skeletal carbonates may carry and preserve unique information about past environmental conditions in their geochemical signatures.
In this session, we invite contributions that explore carbonate deposits as archives of past sea-level, climates and marine environmental conditions through sedimentological, stratigraphic and geochemical approaches, including 3D modelling. Presentations of both case studies and methodological investigations are welcome.

CONVENERS: Nereo Preto (Università di Padova) [nereo.preto@unipd.it], Marcello Caggiati (Università di Ferrara), Giovanna Della Porta (Università di Milano Statale), Marco Franceschi (Università di Trieste), Michele Morsilli (Università di Ferrara)

carbonate platforms, sea-level changes, palaeoclimate, seawater chemistry, modelling

T58. Modern and Ancient River Deltas: processes, models and exceptions

Modern and Ancient River Deltas have for long attracted the attention of researchers for a variety of reasons: they represent the direct connection from the emerged lands and the receiving basins; deltas record a variety of depositional processes and related environments; they support fervent human activities and need to be assessed from natural and anthropogenic risks.

Although the last decades have provided deep insight on both modern and ancient deltas, disentangling process-based subdivision, models and schemes, including dominance of fluvial, tidal and wave influences, river deltas continue revealing even new aspects that stimulate innovative geological researches. For instance, river deltas have been documented as: i) sediment archives of past extreme events; ii) hotspots of pollutants at the land-ocean continuum; as well as iii) ancient systems that incorporate significant georesources.

With this session, we aim at encouraging the presentation of works with interdisciplinary approaches on the studies of river deltas, with the goal of providing a platform for the exchange of knowledge and ideas dedicated to advancing our understanding of modern and ancient systems. In particular, works on the latest advancements in assessing geological and numerical models associated with modern river deltas, methodologies, case studies, and predictive models to enhance our understanding of deltaic vulnerabilities, will be welcome. The implications of climate change, human activities, risks, and natural processes on deltaic regions, along with the influence of biodiversity, hydrodynamics, and climate on deltaic ecosystem functioning, the quantification of sediment transport, flooding impact, and maintenance of deltaic areas are top-notch topics.

Studied and case histories on ancient deltas and their departures from conventional depositional models will be all welcome contributions.

CONVENERS: Sergio G. Longhitano (Università degli Studi della Basilicata) [sergio.longhitano@unibas.it], Claudio Pellegrini (CNR), Luisa Sabato (Università degli Studi di Bari A. Moro),

river deltas; processes; outcrop; subsurface; models, anomalies

T59. Frontiers in the regional geology of the Apennines: a multidisciplinary perspective

The Apennines are a segment of the Alpine orogenic system bounding the central-western Mediterranean Sea. They consist of fold-and-thrust belts formed by the tectonic superposition of Meso-Cenozoic oceanic and continental thrust sheets.
In the context of sustainability management, this session, which is dedicated to the regional geology of the Apennines, aims to spotlight the geologic evolution of different domains forming a unique and restless mountain belt. Documenting phases of pre-orogenic rifting, orogenic shortening, and post-orogenic extension provides insights into present-day and paleogeographic reconstructions, aligning with the renewed interest in regional studies catalyzed by national cartographic projects.
This session seeks to elucidate the Apennines' evolutionary story through stratigraphy, sedimentology, palaeontology, and tectonics. We welcome abstracts on diverse research themes, including structural and stratigraphic analysis, thrust systems, subsurface seismic analysis, facies analysis, field geology, cartography, paleoenvironment, depositional systems, and paleogeographic evolution. Encouraging innovative interdisciplinary contributions spanning geophysics, geochemistry, petrology, and applied geology, we aim to pioneer advancements at the frontiers of regional geology. By exploring the regional geology of the Apennines, we aspire to deepen our understanding of the Mediterranean chains' history and contribute to the sustainable management of its resources.

CONVENERS: Sabatino Ciarcia (Università del Sannio) [sabatino.ciarcia@unisannio.it], Giovanni Luca Cardello (Università di Sassari), Domenico Cosentino (Università RomaTre), Stefano Vitale (Università di Napoli Federico II), Andrea Artoni (Università di Parma)

northern Apennines, central Apennines, southern Apennines, stratigraphy, sedimentology, palaeontology, tectonics, structural geology, central-western Mediterranean geodynamics

T60. Global Stratotype Section and Points (GSSPs) and Standard Auxiliary Boundary Stratotype (SABSs): state of art, current research, and future perspectives

Global Boundary Stratotype Sections and Points (GSSPs) and Standard Auxiliary Boundary Stratotypes (SABSs) are reference points for defining stage boundaries and reference sections for complementary expression of the boundary itself respectively. Several GSSPs have been defined and already ratified in the Mediterranean area and particularly in Italy, while others are being worked on. They are worthwhile examples of using multiple stratigraphic methodologies (astro-cyclostratigraphy, paleomagnetic stratigraphy, high-resolution integrated biostratigraphy, radiometric dating) for the construction of the International Chronostratigraphic Chart and represent geological sites of international interest. This session, organised by the Italian Commission on Stratigraphy, intends to update the state of knowledge on ongoing research on the Italian GSSPs and SABSs and evaluate new perspectives for enhancing the chronostratigraphic heritage from Tethyan Ocean and Mediterranean Sea. We invite contributions focused on: i) stratigraphic development on new potential Italian reference sections, ii) ongoing studies improving accuracy of already ratified boundaries, iii) valuable efforts for the protection and promotion of the geosites for both scientific use and valorization of the geoheritage.

CONVENERS: Piero Gianolla (Università di Ferrara) [cis.stratigrafia@gmail.com], Antonino Briguglio (Università di Genova), Luca Capraro (Università di Padova), Andrea Fiorentino (ISPRA) , Patrizia Maiorano (Università di Bari)

Chronostratigraphy, Italian GSSPs and SABSs, international geosites

T61. Open session on Stratigraphy

The open session on Stratigraphy is organized by the Italian Commission of Stratigraphy (CIS) and welcomes a wide range of contributions from the broad spectrum of the different stratigraphic approaches. The session will therefore bring to the discussion topics of general interest, both on traditional stratigraphic methodologies, on examples of application of new and innovative stratigraphic techniques, and on the interactions that Stratigraphy has with other fields of Geology. Contributions on integrated stratigraphic studies and their application from the ongoing Geological Map of Italy at scale 1:50,000 - CARG Project are encouraged.

CONVENERS: Piero Gianolla (Università di Ferrara) [piero.gianolla@unife.it], Cristina Muraro (ISPRA), Luca Capraro (Università di Padova), Andrea Fiorentino (ISPRA), Luigi Spalluto (Università di Bari)

Stratigraphic classification, stratigraphic tools

T62. Source-to-sink processes and genesis of resources in sedimentary deposits: advances in understanding of geologic and environmental dynamics through a multidisciplinary perspective.

Source to sink systems describe the response of the Earth's surface to tectonic and climatic signals over geological times. Understanding these dynamics is pivotal to significantly improve human's ability in predicting the characteristics of sedimentary accumulations hosting natural environments and geodiversity, as well as essential societal and industrial resources (geomaterials, energy, minerals, groundwater, waste). Tomorrow's successful exploration of Earth resources for future sustainable and responsible growth relies on training the next generation of researchers with a holistic approach to these issues.
We invite researchers working on all interdisciplinary aspects of source to sink systems, including standard and new approaches aimed to constrain the sediment production, emphasizing the role of sand(stone) in understanding Earth processes and dynamics of the sediment routing system. This session is also an opportunity to illustrate the advances in the study of weathering processes and landforms which are widely investigated at different scales and in several environments, showing relationships with rock susceptibility to in situ degradation, slope instability and erosion. Therefore, these processes are crucial in sedimentary geology and geomorphology to evaluate both the climatic setting and the natural hazards of mountain and coastal landscapes.
This session welcomes contributions on multidisciplinary research including experimental and modelling studies as well as geological, sedimentological, geomorphological, geotechnical, petrological, mineralogical, geochemical, paleogeographic, provenance, and marine geology investigations.
Case study of ancient clastic sequences and modern analogues in different climate and geotectonic settings are welcome in this session as well. We also hope for the contribution of professional geologists, especially those concerned with groundwater and economic geology.

CONVENERS: Francesca Micheletti (Università degli Studi di Bari Aldo Moro) [francesca.micheletti@uniba.it], Anna Chiara Tangari (Università della Calabria), Sara Criniti (Università della Calabria), Emilia Le Pera (Università della Calabria), Fabio Matano (CNR Napoli), Massimo Moretti (Università degli Studi di Bari Aldo Moro)

source to sink, landscape evolution, weathering, sand(stone), raw materials, sedimentary reservoir

T63. Burial/exhumation history of sedimentary basins: linking deep-seated and surface processes and applications for a sustainable future

Sedimentary basins are natural archives for past tectonic and erosional events. Their evolution through time is linked to tectonics, climate and source-to-sink processes which govern some key processes in the geological cycle such as the transport dynamics of sediments, fluid flows, mineralisation and carbon mobility. Temperature through time is also one of the most critical parameters that monitor and/or control several of these processes. The reconstruction of basins' burial/exhumation and thermal histories can be thus used to infer the rates of regional and local processes acting in convergent/divergent margins or more complex intraplate tectonic settings. This has a relevant impact on socio-economic and anthropogenic activities.
This plays a crucial role in our society because it is linked to natural resources such as hydrocarbons, minerals for energy transition technologies, geothermal energy, CO2 storage, nuclear waste disposal, and water supply.
This session aims to bring together interdisciplinary contributions that present tectono-stratigraphic-morphologic evolution of sedimentary basins and their margins worldwide. We actively promote contributions from early career scientists and under-represented minorities within the scientific community. Additionally, we welcome the application of different methodological approaches and new techniques aimed at the exploration of resources for a more sustainable future.

CONVENERS: Andrea Schito (Università di Aberdeen/Università di Barcellona) [andrea.schito@abdn.ac.uk], Sveva Corrado (Università di Roma Tre), Lorenzo Gemignani (Università di Bologna), Marta Gasparrini (Università Statale di Milano), Francesca Stendardi (Università di Pavia)

T64. Stratigraphic and morphological markers of extreme events during the Quaternary

The Quaternary is marked by deep variations in geological dynamics at different temporal and areal scales. Endogenic processes (tectonics and geodynamics) and exogenic ones (e.g.: climate variations, sea level changes, glacier dynamics and, lastly, human activity), often together, activated dynamics that have dramatically modified the landscape in a short time span, sometime instantaneously.
Both continental and marine environments, as well as transitional ones, have undergone changes due to the impact of tectonic and volcanic events, climate variations and the related changes in glacier extent, sea level and precipitation distribution. These changes led to dramatic variations in the relief energy. Some environments, in particular continental sedimentary basins (e.g.: alluvial plains and lake areas) and marine and transitional ones (e.g.: ocean floors, continental shelf and lagoon areas), recorded accumulation of sediments, which testify the occurrence of extreme events. On the other hand, coastal areas and river catchments, periglacial and glacial areas could have been strongly shaped by their occurrence, exacerbated by the increase in the relief energy.
The focus of this session is:
ì – Highlighting stratigraphic and morphological markers of the impact of extreme events at different time scales during the Quaternary.
ìì – Propose a correlation at local, regional and where possible global scale of their evidence.

CONVENERS: Giuseppe Mastronuzzi (Università degli Studi di Bari Aldo Moro) [giuseppe.mastronuzzi@uniba.it], Giovanni Monegato (CNR – Padova),
extreme events, geological markers, morphological markers, geo-morphostratigraphy, Quaternary.

T65. The evolution of the Circum-Mediterranean Chains as recorded by stratigraphic, sedimentary, petrographic, and geochemical signals of ancient deep marine systems: new data and recent advances

The sensitivity of deep marine clastic deposits to record the evolution of mountain belts, related foreland basin systems and paleogeography can be evaluated through high resolution stratigraphic reconstructions, detailed facies analysis, detrital modes of sandstone, detrital zircon contents and distribution of paleothermal indicators. The latter permits the modeling of burial and thermal history of the basin as well as the tracing of provenance and of the alteration processes affecting the chain belts, thereby giving useful insights about the general evolution of an orogenic chain. The integration of these diverse analytical methods has enabled the formulation of suitable paleogeographic and paleotectonic models trying to explain foreland basin systems evolution and has allowed the study of their associated source areas across various stages of orogen growth.
This session invites presentations of classic and novel research, with a specific focus on stratigraphic, sedimentary, petrographic, thermal, and geochemical studies of exposed deep marine clastic deposits. The primary objective is to discuss recent advancements in comprehending and improving existing depositional, paleogeographic, and paleotectonic models of Alpine Circum-Mediterranean Chains, as well as to propose brand-new ideas, and to draw comparisons with analogous geodynamic settings worldwide.

CONVENERS: Salvatore Gallicchio (Università degli Studi di Bari) [salvatore.gallicchio@uniba.it], Luca Aldega (Sapienza Università di Roma), Paola Cipollari (Università degli Studi Roma 3), Annamaria Fornelli (Università degli Studi di Bari A. Moro), Andrea Civa (Eni S.p.A.),

Deep marine clastic deposits, high resolution stratigraphic reconstructions , biostratigraphy, U-Pb detrital zircon ages, facies analysis, tectonics and sedimentation, provenance of sandstones, paleothermal indicators, basin analysis

T66. Geophysics and Tectonics: experimental, theoretical and observational studies

Geophysical Studies play a key-role for tectonic assessment both in terms of geometrical and of active processes definition. The integration of different methodologies complementary in their prospecting and at different resolution scales is a necessary approach to develop and test competing tectonic models.
We expect contributions derived from several disciplines, such as applied geophysics, seismology, geodesy, remote sensing. In this context, the contributions in analytical and numerical modeling of Earth dynamics and the inter-disciplinary studies involving geochemical, geological and petrophysical studies, highlighting the multiscale properties of natural processes are welcome.

CONVENERS: Agata Siniscalchi (Università degli Studi di Bari) [agata.siniscalchi@uniba.it], Andrea Tallarico (Università degli Studi di Bari), Luca de Siena (Università di Bologna), Ivana Ventola (Università degli Studi di Bari), Giulio Selvaggi (INGV Roma)

geophysics, tectonics, multi-scale

T67. Georesources in orogens and basins: thermal processes, fluid-rock interaction and structural constraints

This session aims to promote an understanding of the processes that lead to the genesis and localisation of resources, which are central to the renewable energy transition towards fossil fuel phase-out, decarbonisation and climate change mitigation. As key factors, georesources are related to the thermal state of the lithosphere and its perturbations and the nature of the fluids (metamorphic, magmatic and meteoric) circulating through ductile or brittle shear zones of the crust during orogenic events and subsequent post-collisional evolution, rifting episodes and filling of sedimentary basins. The knowledge of these issues is crucial for understanding to what extent georesources are renewable and if their exploitation is sustainable. In this view, georesources include geothermal energy and heat source anatomy, metal ore deposits and REE concentrations (e.g. for energy storage or high technology manufacturing) as a result of fluid-rock interaction processes, their transport and storage in structural traps or sediments when derived from the erosion of exposed critical element rich rocks. Irrespective of the scale of investigation, we welcome contributions based on field and/or laboratory analyses, as well as numerical simulations and experimental studies, illustrating case histories in different geological environments and integration between different data sets and approaches.

CONVENERS: Domenico Liotta (Università di Bari) [domenico.liotta@uniba.it], Massimo Verdoya (Università di Genova), Cristina Pauselli (Università di Perugia), Andrea Brogi (Università di Bari), Federico Lucci (Università di Bari)

georesources, lithosphere, orogen, basin

T68. Groundwater resources innovation and sustainability: from characterisation to management of saturated and unsaturated zone

Groundwater, the predominant source of drinking and irrigation supply, is globally under dramatic pressure due to overexploitation, pollution, seawater intrusion, and the effects of climate change.
The session aims to give visibility to the most innovative hydrogeological research and sustainability techniques, at the local, site and basin scale, to better understand aquifers, to counter the risks of qualitative and quantitative degradation, to increase the knowledge on how water on contaminants transport, including microorganisms, that move through the unsaturated zone to the groundwater.
A non-exhaustive list of desired contributions includes theoretical and experimental studies, both at laboratory and field scale. Topics as tools, equipment, methods, modelling and/or experiences regarding hydrogeological, geophysical, geochemical, monitoring and characterization of aquifer, climate change impacts, quantity and quality risks for groundwater resources are welcome.
In addition aquifer management methods, including MAR plants using unconventional or treated water, tools for efficient online visualization and dissemination, monitoring and remediation experiences are also encouraged.

CONVENERS: Maria Clementina Caputo (CNR-IRSA) [maria.caputo@ba.irsa.cnr.it], Stefania Da Pelo (Università di Cagliari), Lorenzo De Carlo (CNR-IRSA), Matia Menichini (CNR-IGG), Maurizio Polemio (CNR-IRPI), Glenda Taddia (Politecnico di Torino)

hydrogeology, hydraulic characterization, integrated approaches, groundwater contamination, groundwater management, remediation

T69. Innovation toward sustainable and regenerative farming

Recognizing the impact of modern farming on the environment and climate change drives to seek new practices for agri-food production. It is shaping a transformative landscape toward sustainable and regenerative farming, where the effort is concentrating on methodologies for the preservation and enhancement of natural resources, that requires comprehensive and interdisciplinary approaches.
This session aims to spotlight latest advancements and current research in sustainable farming, in line with the European Green Deal targets, delving into the incorporation of new methodologies, processes, and materials, also incentivizing but being not restricted to PNRR actions.
Laboratory and field research works are highly encouraged, as well as case studies on larger scale.
Contributions to this session may therefore encompass:
• Insights on the soil system dynamics for mitigating greenhouse gas emissions and nutrient losses. Implications in land management.
• Innovative fertilizers and techniques to reduce nutrient pollution and increase fertilization efficiency.
• Bio and geomaterials to ameliorate soil properties.
• Efficient recovery and reuse of agricultural byproducts. Recycling of materials in the agrifood sector.
• Innovative management of the livestock supply chain with the aim of reducing environmental impact.
• New strategies for the control of phytopathogens and replacement of chemical pesticides.

CONVENERS: Giulio Galamini (Università degli Studi di Modena e Reggio Emilia) [giulio.galamini@unimore.it], Daniele Malferrari (Università degli Studi di Modena e Reggio Emilia), Giacomo Ferretti (Università degli Studi di Ferrara), Luisa Barbieri (Università degli Studi di Modena e Reggio Emilia)

agricultural sustainability, land management, recycling, soil and plant system, fertilizer use efficiency, amendment,

T70. New frontiers in georesources exploration, exploitation storage and monitoring

The sustainable management of georesources is mandatory, considering the global increase in energy demand and the urgent need to tackle climate change and promote low greenhouse gas emission technologies.
The current global energy supply chain still heavily relies on fossil fuels. In this respect, the increase in renewable energy sources, such as geothermal energy and hydrogen geological storage, and low-CO2 emitting technologies (CO2 capture and storage i.e. CCS) must be favored, as well as new exploration frontiers such as hydrogen and unconventional techniques like raw-strategic materials.
Such exploitation choices are often associated with geohazards, such as fluid leakage, induced uplift, subsidence, and seismicity. In light of this, geoscientists can play a key role in increasing scientific knowledge about georesource exploration and exploitation processes, and mitigating every possible geohazard.
This session welcomes multidisciplinary contributions devoted to areal screening, site selection, reservoir characterization, and monitoring, by geophysical-geochemical methods, of exploited geo-energy systems as geological storage (e.g., carbon dioxide, methane, hydrogen, nuclear waste disposal) and geothermal systems (conventional and unconventional). Last but not least, we also welcome and encourage contributions focusing on the ethical and social impact of the exploration and exploitation of georesources.

CONVENERS: Mario Anselmi (Istituto Nazionale di Geofisica e Vulcanologia) [mario.anselmi@ingv.it], Mauro Buttinelli (Istituto Nazionale di Geofisica e Vulcanologia), Monia Procesi (Istituto Nazionale di Geofisica e Vulcanologia), David Iacopini (Università degli Studi di Napoli Federico II)

georesources, geological storage, monitoring, geohazards, geoethic, social impact

T71. New frontiers in sustainable engineering geology design

Among the main environmental objectives of the 2030 Agenda for Sustainable Development of the United Nations, topics such as the fight against climate change, the conscious and responsible exploitation of natural resources, the prevention and reduction of geo-hydrological or seismic risk, the eco-compatible management of waste, the reduction and prevention of water pollution as well as the protection and conservation of the historical-cultural heritage are of fundamental importance for the future of the planet.
The achievement of these objectives requires a new way of thinking and acting, based on a holistic vision of development and nature in accordance with economic, social and institutional aspects and implications. This results in the need for integrated multidisciplinary approaches which, although complex, require new frontiers in both basic and applied research.
In line with the new sustainable objectives of the 2030 Agenda, this session aims to present original contributions of basic and applied research on land protection and risk mitigation, geotechnical constructions, geothermal energy production, innovative and multidirectional laboratory and in situ investigation techniques and methodologies, assessment of vulnerability and protection from groundwater and aquifer pollution, conservation, protection and valorization of the geological and cultural heritage. Case studies may concern both different areas of italy, which due to its natural, architectural and historical conformation represents a sort of natural laboratory for the study of catastrophic phenomena aggravated by anthropic impact, and sites abroad.

CONVENERS: Gioacchino Francesco Andriani (Università di Bari) [gioacchinofrancesco.andriani@uniba.it], Claudia Cherubini (Università di Trieste), Concetta Immacolata Giasi (Politecnico di Bari), Nicola Pastore (Politecnico di Bari), Nicola Sciarra (Università di Chieti-Pescara)

Engineering Geology, Geodisaster, Slope Failure, Natural resource, Heritage, Risk Protection, Sustainability

T72. Recent advances in karst research, with particular focus on underground waters

Karst shows a high degree of complexity and vulnerability, given the intrinsic anisotropy and physical properties of the system, and the direct link existing between the surface and underground environment. Water stored within fractured and karstified rock masses often represents the only available freshwater resource for local communities. In the context of climate changes, the amount of underground water is threatened by such changes and by incorrect anthropogenic actions as well. The comprehension of groundwater hydrodynamic is essential to manage the precious underground freshwater and guarantee its availability for future generations.
In this session we welcome contributions dealing with karst hydrogeology, geomorphology, geochemistry, groundwater flow modeling, etc., in order to improve our knowledge on karst environment, with the final aim to mitigate the problems related to management of karst aquifers.

CONVENERS: Isabella Serena Liso (Università degli Studi di Bari Aldo Moro) [serenaliso.uniba@gmail.com], Alberto Riva (Università di Ferrara), Daniela Valigi (Università degli Studi di Perugia), Alberto Tazioli (Università Politecnica Delle Marche), Rita Masciale (CNR -Bari)

karst environment, geomorphology, hydrogeology, geochemistry, thermal water, speleogenesis, modelling, exploration

T73. Sustainable raw material supply to boost the green and digital transition: the role of mineral waste recovery and recycling

The continuing growth in the demand for industrial and critical raw materials for industrial development is a challenge the EU has faced from technological, economic, social and environmental perspectives. Raw materials exploitation and processing are inevitably accompanied by the production of large volumes of extractive waste (EW), successively stored in extractive waste facilities or connected to ongoing exploitation and processing phases. Contemporary, vast quantities of waste materials associated with construction and demolition activities (CDW) and infrastructures (excavated waste) have to be managed and (hopefully) recovered/recycled. Thus, managing mineral waste (CDW, EW, excavated waste) represents a challenge and a potential to take advantage. Promoting sustainable mining (from natural and anthropogenic deposits) and a circular economy represent a top-rating challenge for transitioning to a greener and more digital society. This challenge had to be faced in an interdisciplinary manner, involving all the actors dealing with raw materials supply: experts (geologists, engineers, environmental scientists, economists, social scientists, etc.), public administrations, industries, policymakers, etc. Further, the promotion of circular economy and sustainable mining principles has to be accompanied by financial tools and updated legislation. The main topics that will be discussed in this session cover, but are not limited to:

- Characterization of geomaterials, their environmental interactions and decay.
- Characterization of industrial residue resources and their environmental assessment.
- Exploitation and valorization of secondary raw materials from waste
- Estimation and (potential) exploitation of critical raw materials associated with extractive waste
- Multidisciplinary investigation of ore deposits to determine the best scenarios for RM exploitation and processing (with contemporary exploitation of SRM, by-products, etc.)
- Modern tools and technologies to estimate the quality and quantities of resources present in extractive waste (from decision support tools to the use of A.I.)
- Role of scientists in the transition to sustainable mining
- Case studies about RM/CRM/SRM exploitation of extractive waste

CONVENERS: Sossio Fabio Graziano (Università di Napoli) [sgraziano@unina.it], Gabriele Baldassarre (Politecnico di Torino), Giovanna Antonella Dino (Politecnico di Torino), Gianluca Iezzi (Università di Chieti)

sustainability, waste management, resource recycling, secondary raw materials, circular economy, geomaterials, mineral recovery

T74. Active faults and crustal deformation in the Mediterranean area from prehistorical to present times: state of the art

Recent years provided significant advancements in understanding active faults and crustal deformation in the Mediterranean area, which includes diverse seismotectonic settings. This was favoured by improvements in methods and technologies applied to paleoseismology, tectonic geomorphology, onshore and offshore geophysical imaging of active faults, tectonic geodesy, geochronology, etc., and by recent earthquakes that provided novel insights on rupture processes, surface deformation patterns and on the deep structures of active faults. However, many seismogenic sources of historical earthquakes remain unidentified and quantitative parameters for several active deformation belts are lacking.
This session aims to foster a discussion on the state-of-the-art of the knowledge on active faults, seismogenic sources and seismotectonic models in the Mediterranean area.
We welcome contributions that provide new insights on:
1) the investigation of active faults and of their seismogenic potential;
2) the earthquake sources and of their relationships with known or unknown crustal faults;
3) the analysis of historical earthquakes and their possible attribution to specific seismogenic sources;
4) the seismotectonic context and the pattern of strain accumulation and release;
5) the reconstruction of paleoseismic events through multidisciplinary approaches;
6) the development of methods for exploring earthquake recurrence.

CONVENERS: Luigi Ferranti (Università di Napoli) [lferrant@unina.it], Francesco Iezzi (Università di Napoli), Andrea Brogi (Università di Bari Aldo Moro), Pierfrancesco Burrato e/o Gianluca Valensise (INGV Roma), Carmelo Monaco (Università di Catania), Fabrizio Pepe (Università di Palermo)

T75. Evolution of the Variscan crust

The architecture of the Variscan crust and the distribution of its ore deposits is the result of a complex geodynamic history, starting in the early Cambrian with the break-up of the Gondwana margin along a Cadomian back arc. In the Ordovician-Early Devonian, oceanization forced continental drifting of different Gondwana-ribbon terranes that were accreted into Laurentia margin to create Laurussia. Continental convergence in the Early-Late Devonian led to subduction of the Lower Paleozoic oceans, and to the complex continental collision between Laurussia and Gondwana, involving thin-skinned, gneiss dome and wrench-tectonics in Late Devonian-Permian, forming the Variscan Orogen and Pangaea. It records net crustal growth by magmatic underplating and development of long-lasting volcanic arcs. Variscan sedimentary, magmatic, and tectono-metamorphic processes influenced the distribution of World-Class critical minerals deposits. In this session, we welcome contributions that discuss the evolution of the Variscan crust using different approaches encompassing, but not limited to, paleontological, stratigraphic, structural, petrological, geophysical, and geochronological methods. Multidisciplinary studies combining one or more of the above methods and analogue or numerical modelling are particularly welcome, as well as studies aiming at unravelling the paleogeographic evolution of the different Variscan terranes and processes controlling the development of relevant orogenic ore deposits.

CONVENERS: Fabrizio Cocco (Università di Cagliari) [fabrcocco@unica.it], Ícaro Fróis Dias da Silva (Università di Lisbona), Salvatore Iaccarino (Università di Torino), Alfredo Idini (Università di Sassari), Stefano Naitza (Università di Cagliari)

Paleozoic; Gondwana; Pangaea, Paleogeography, Geodynamics; Ore deposits

T76. Geological and geophysical data, tools, and models for the exploration of the Earth crust in times of energy transition

In the past decades, integrated geological and geophysical studies of the subsurface stratigraphic and structural setting of the upper and lower crust have highlighted their pivotal role in providing essential support to the industrial sector. This is especially crucial for promoting sustainable development and optimizing the efficient utilization of subsurface resources, particularly in the context of energy production.
These multidisciplinary studies, essential to reduce subsurface uncertainty, de-risk drilling, and ensure the safe operation of the exploitation projects, have also produced significant scientific advances, for the comprehension of the tectono-sedimentary evolution of the sedimentary basins, in different tectonic setting. The aim of this session is to explore the (actual and potential) contribution of geological and geophysical studies to the development of new energy sources in the transition to low-carbon energy, essential to tackle Climate Change and bring humanity toward a fairer and more sustainable society. Contributions are welcome, covering a wide range of consolidated and/or innovative geological and geophysical methodologies and multidisciplinary approaches, being applied to either sustainable energy research and developments (e.g. geothermal, hydro and wind), or to subsurface storage of CO2 (CCS) and hydrogen, and to the appraisal and exploration of critical raw materials. Contributions may also include the AI and ML capabilities, in acquiring, processing and modelling the surface and subsurface data.

CONVENERS: Sabina Bigi (Univerità La Sapienza di Roma) [sabina.bigi@uniroma1.it],
Massimiliano Barchi (Università di Perugia), Francesca Salvi (Eni SpA), Valentina Volpi (OGS)

geophysical methods, energy sources, energy transistion

T77. Geological models at meso and macro scales: new insights for mitigating uncertainty through multidisciplinary approaches

Accounting for uncertainty in geological models constitutes a crucial challenge for geoscientists, with significant implications for sectors such as exploration, natural resource management, and geological risk assessment. In the geological domain the uncertainty, resulting from various sources, is the norm but can be quantified and mitigated through a multidisciplinary approach combining field-based surveys, with geophysical investigations (e.g., seismic interpretation, well data analysis, gravimetric modelling, seismic tomography), advanced technologies (e.g., remote sensing) and geostatistical methods.

The session aims to share knowledge, experiences, and methodologies of researchers from different disciplines, contributing to enhancing the accuracy and reliability in geological modelling, and increasing the awareness of the geoscientific community about the technologies to be applied to promote data integration.

The session will focus on experiences in multidisciplinary approaches from meso to macro-scale, methods for uncertainty quantification and communication, including, but not limited to, three-dimensional geological models, geophysical models, deep tectonic interaction models and geocellular integrated volumes.

We welcome contributions, also deriving from national and European projects (e.g., CARG, GeoSciences IR, MEET, EPOS, GSEU) focused on advanced and multidisciplinary approaches, methodologies, and tools.

CONVENERS: Sara Ciattoni (Università di Urbino) [s.ciattoni@campus.uniurb.it], Chiara D'Ambrogi (ISPRA), Fabio Feriozzi (Università di Roma Tre), Matteo Pedini (Università degli Studi di Camerino)

Geological modelling – data integration – multidisciplinary approach

T78. Interplay between Deformation, Fluid Flow and Fluid-Rock Interactions in Sedimentary Rocks: Implications for Seismicity, Basin Analysis and Reservoir Characterization

Sedimentary rocks cover most of the Earth's surface and are deposited in different tectonic-geodynamic settings and depositional environments. The combined study of deformation mechanisms, diagenetic processes, and fluid flow patterns affecting sedimentary rocks has crucial importance for both scientific research and the global economy. Sedimentary rocks represent strategic targets for resource supply (groundwater, geothermal energy, hydrocarbons, ore deposits), underground gas storage (anthropogenic CO2, H2), as well as risk evaluation (groundwater contaminant transport). Moreover, the study of sedimentary rocks is essential in climate change mitigation through greenhouse gas sequestration from the atmosphere to the geosphere.

We encourage contributions to this session by submitting original multidisciplinary research lines dealing with the following topics:

- Analysis of meso- and micro-scale brittle deformation affecting sedimentary rocks deformed in various tectonic settings, under different kinematics and depths of deformation.
- Relationships between brittle structures (i.e., faults, deformation bands, joints, veins, and stylolites) and selective diagenetic processes (i.e., cementation, dissolution, and mineral replacement).
- Fluid-rock interaction processes active at different depths and time from rock deposition to final exposure.
- Definition and quantification of fluid flow patterns both through numerical modeling as well as direct measurements of petrophysical-hydraulic properties.

CONVENERS: Mattia Pizzati (Università di Parma) [mattia.pizzati@unipr.it], Barbara Marchesini (Università Sapienza di Roma), Leonardo Del Sole (Università di Bologna), Martina Rocca (Università Milano-Bicocca)

Brittle deformation; Fluid flow; Fluid-rock interactions; Basin analysis; Reservoir characterization

T79. Multidisciplinary approaches to the geometric and kinematic definition of seismogenic faults

Geological structures capable of generating significant earthquakes release elastic stress accumulated during the interseismic phases at depths of 10-15 km into the upper crust.
While the surface effects of higher magnitude earthquakes can be recognized and studied through well-established techniques at the surface, the portion of the faults where the ruptures nucleate can only be investigated through indirect observations that include reflection and refraction geophysical prospecting, tomographic analysis at various scales, and other geophysical methods (e.g. gravimetry, magnetometry.
The processes that lead to the formation or reactivation of faults in the upper crust can also be investigated through numerical and/or analogue modelling, that provide insights into the geomechanical processes that drive deep fault structuring.
The session aims to gather contributions integrating different methodologies aimed at the geometric and kinematic description of seismogenic and potentially seismogenic faults from the topographic surface to the base of the seismogenic layer.
We encourage contributions that explore the geometric and kinematic characteristics and variability of tectonic structures at the surface and subsurface through active and passive geophysical methods, analogue and numerical modelling, and structural-geological field analysis, as well as through the integration of these. Contributions from doctoral students and young researchers will be especially welcome.

CONVENERS: Ada De Matteo (Università degli Studi di Pavia) [ada.dematteo@unipv.it], Francesco Emanuele Maesano (Istituto Nazionale di Geofisica e Vulcanologia, Roma), Simone Bello (Università G. d'Annunzio Chieti Pescara), Daniele Maestrelli (Università di Firenze)

Seismogenic faults, Fault modelling, Active tectonics

T80. Unveiling earthquake mechanics, from field to laboratory based approach

Earthquake mechanics is controlled by processes active over a wide range of scales, from kilometres to nanometres and from seconds to thousands of years. The 3-D structure of fault systems and the thermo-hydro-mechanical properties of fault rocks affect the nucleation, propagation and arrest of seismic ruptures, which can locally reach the topographic surface. Nevertheless, our comprehension of earthquake mechanics remains limited due to the impossibility to access seismogenic faults at hypocentral depths.
Consequently, unravelling the wide and complex spectrum of processes governing earthquake mechanics and the seismic cycle along fault zones, requires a multidisciplinary and multiscale approach including field-based investigations, micro-analytical techniques, rock-deformation experiments and numerical modelling.
In this session, we welcome contributions dealing with the different aspects of earthquake mechanics, such as (but not limited to):
- Quantification of the 3-D fault structure through structural and geophysical investigations;
- Investigations of the on- and off-fault deformation processes through microstructural and geochemical analysis of natural and experimental fault rocks;
- Evolution of the mechanical, frictional and transport properties of faults from field to laboratory scale;
- Modelling of seismic sequences considering long-term evolution of realistic fault networks.

CONVENERS: Simone Masoch (Università degli Studi di Padova) [simone.masoch@gmail.com], Rocco Novellino (INGV), Giovanni Toffol (Università degli Studi di Padova), Mattia Pizzati (Università di Parma), Barbara Marchesini (Università di Roma La Sapienza), Stefano Aretusini (INGV)

T81. New challenges in reservoir and seal rocks characterization

Reservoir and seal rock mechanics are having an increasing importance in georesources studies. Geothermal reservoirs characterization requires different information with respect to those for Oil and Gas. Cyclic hydrogen injection into and withdrawal from the geological formations, may induce fatigue changing rocks mechanical properties. Moreover, recent failures in prediction of mechanical properties of the modelled gas-hydrate reservoirs, highlight the importance of characterizations based on actual data. At the laboratory scale, petrophysics and rock deformation experiments allow to measure changing properties and to reproduce the mechanisms acting at different boundary conditions. Field-scale observations such as structural and facies analyses, GPS data and subsurface measurements provide larger scale information. Computational modelling can be then used to test the reliability of laboratory and field data; however, such integration is challenging. Thus, new laboratory and field scale techniques and new models need to be tested to properly predict the mechanical behavior and the associated risks of reservoir and seal rocks. This session aims to bring together researchers focusing on the reservoir and seal rocks characterization at different scale and with different expertise such as for example sedimentologist, structural geologists, seismologists, or geophysicists. Cutting-edge applications to the challenges opened by new georesources are greatly encouraged.

CONVENERS: Fabio Trippetta (Sapienza Università di Roma) [fabio.trippetta@uniroma1.it], David Iacopini (Università degli Studi di Napoli Federico II), Sergio Carmelo Vinciguerra (Università di Torino)

Reservoir, Seal, Rock mechanics, Risks, Petrophysics, Laboratory, Georesources, Energy

T82. Unveiling the long-lasting evolution of active margins from field to micro-scale

Active margins, which allow the deciphering of many long-lasting geological processes, probably represent the most complex type of plate boundaries. They inspire significant global interest for pure research geologic purposes, as well as for economic geology. They can be investigated within a wide variety of tectonic environments, such as subduction zones, collisional orogens, volcanic arcs and back-arc basins and extensional settings as well. All possible variables, combined with the geological complexity of these tectonic settings, require an interdisciplinary-integrated approach from field to numerical modeling, from microstructures to thermodynamic modeling.
In this session, we welcome contributions dealing with multidisciplinary studies, both in the brittle and ductile realm, encompassing field mapping, multiscale structural geology, igneous and metamorphic petrology, geochemistry, geochronology, thermochronology, and numerical modeling, aiming to unravel the evolution of orogenic belts (both in the compressional and extensional phases) and the implications for regional tectonics.

CONVENERS: Lorenzo Dulcetta (Università degli Studi di Cagliari) [lorenzo.dulcetta@unica.it], Chiara Montemagni (Università degli Studi di Milano Bicocca), Vincenzo Festa (Università degli Studi di Bari Aldo Moro), Costantino Zuccari (Università degli Studi di Pisa / Università degli Studi di Bologna), Matteo Simonetti (Servizio Geologico d'Italia, ISPRA), Manuel Roda (Università degli Studi di Milano)

Orogenesis, deformation, metamorphism, compressive/extensional tectonics, geochronology, igneous magmatism

T83. Multi-disciplinary investigation of magmatic processes: experimental petrology, eruptive products analysis and numerical modelling to constrain dynamics and timescales of magmatic processes

Volcanoes are among the most important natural hazards and investigating the dynamics and timescales of magmatic processes that occur prior to an eruption is key to assess volcanic hazards and to mitigate potential risk. This includes processes like magma generation and storage, fractional crystallization and magma differentiation, magma mixing and contamination, mush re-mobilization, magma ascent dynamics including mineral and volatile exsolution, and fragmentation. Over the last few decades our knowledge of these processes has substantially increased through more precise and accessible analytical techniques for experimental and natural samples and through numerical modelling. Recent advances regard for example the interpretation of crystal growth and crystal zoning patterns or melt and fluid inclusions in erupted products, the analysis of dynamics and timescales of magma mixing, assimilation of host-rocks and bubble nucleation and growth at controlled laboratory conditions or numerical modelling of magma ascent dynamics.
In this session, we aim to bring together studies that investigate the dynamic nature of magmatic processes both in the laboratory and in nature. We welcome multidisciplinary contributions from mineralogy, petrology, volcanology, geochemistry, and numerical modelling to understand magma dynamics from the deep storage zone to the surface and to constrain magma ascent rates prior to volcanic eruptions.

CONVENERS: Marco Knüever (Università di Bari) [marco.knuever@uniba.it], Alessandro Pisello (Università di Perugia), Francesco Maria Lo Forte (Università di Palermo), Emanuele Caruso (Università di Bari)

magmatic processes, experimental petrology, eruptive products, volcanology, numerical modelling

T84. The power of tephra from micro- to macro-scales: advances and applications of tephrostratigraphy and tephrochronology to the reconstruction of past explosive eruptions

Volcanic ashes injected in the atmosphere during explosive eruptions, thanks to their physical properties and under favorable atmospheric conditions, can be rapidly deposited as tephra layers over large areas. Thus, tephra layers can be recorded both in proximal and distal successions and, as geologically synchronous events, they represent important isochrones that are essential for correlations across terrestrial, marine, and lacustrine environments. Moreover, constraining the absolute ages and dispersal areas of tephra markers provides a fundamental tool for reconstructing the eruptive history of volcanoes. Stratigraphical, petrological, and geochemical studies can be used to reconstruct volcanic stratigraphies and to fingerprint individual tephra layers with applications to a variety of disciplines (e.g., volcanology, paleoclimatology, paleoseismology). Also, reconstructing the VEI and eruptive dynamics of past volcanic events is pivotal for future hazard assessment, especially at high-risk volcanoes. In this session, we welcome multidisciplinary studies concerning all aspects of tephrostratigraphy and tephrochronology, as well as their development and application to volcanology, paleoclimatology, paleoseismology, and volcanic hazard assessment. We encourage multidisciplinary contributions concerning the application of tephrostratigraphy and tephrochronology to the reconstruction of past explosive activity and climate, also including new methodologies that can potentially improve our general understanding of volcanic processes.

CONVENERS: Giada Fernandez (Sapienza Università di Roma) [giada.fernandez@uniroma1.it], Lorenzo Monaco (CNR, Roma e Bologna), Gino Gonzàlez-Ilama (Università di Bari)

Tephrostratigraphy, Tephrochronology, Explosive eruptions, Volcanic ashes

T85. Volcanic deposits as a tool to quantify volcanic hazards towards disaster risk reduction

Volcanic hazards like pyroclastic density currents, volcanic plumes, tephra fallout, lahars, dome collapse, debris avalanches, etc. are natural phenomena that are challenging to fully understand, reproduce and forecast in models. Thankfully, all these processes leave a footprint in the geological record that is often a precious (sometimes, the only) source of data which can be used to characterize the process and eventually quantify the hazard. This is particularly crucial for volcanoes that do not erupt frequently or have not erupted in historical times, i.e., volcanoes for which observational data are missing. The ways to quantitatively analyse this geological record and use the field data to model the process generating the deposits, though, are still an open research question for many of the volcanic hazards.
In this session we welcome contributions that deal with the characterization of volcanic processes via the analysis of volcanic deposits. Research bridging the gap between the field evidence and the hazard quantification are particularly encouraged.

CONVENERS: Fabio Dioguardi (Università di Bari) [fabio.dioguardi@uniba.it], Daniela Mele (Università di Bari), Jacopo Natale (Università di Bari), Francesco Neglia (Università di Bari)

volcano geology, volcanic deposits, volcanic hazards

T86. Open Poster Session