La **Società Geologica Italiana (SGI)** e la **Società Italiana di Mineralogia e Petrologia (SIMP)** vi invitano a partecipare al Congresso congiunto, dal titolo ***Geosciences for a sustainable future***, che si terrà a Torino con sede negli spazi espositivi e nelle aule congressuali di TORINO ESPOSIZIONI sito in Corso Massimo D'Azeglio 17:

workshops PRE-CONGRESS **17 settembre 2021**

sessioni CONVEGNO **dal 19 al 21 settembre 2022**

workshops POST-CONGRESS **22-23 settembre 2022**

Il Congresso sarà organizzato in sessioni scientifiche sulle principali tematiche delle Geoscienze; includerà conferenze plenarie di studiosi di rilievo internazionale, tavole rotonde, workshops e forum su argomenti di rilevante impatto geologico-sociale e su grandi temi di interesse pubblico.

Il Congresso costituisce il luogo privilegiato per l'incontro dei diversi attori operanti nel mondo delle Geoscienze. Per gli studiosi rappresenta un importante momento di confronto in cui esporre le proprie ricerche e discutere i risultati; per i professionisti costituisce una valida opportunità per l'aggiornamento professionale e per l'approfondimento di competenze proprie dell'ambito in cui operano; per gli insegnanti di scuola è l'occasione per confrontarsi sui contenuti e sui metodi didattici delle Geoscienze oltre a fornire la possibilità di instaurare rapporti di collaborazione laboratoriale con il mondo della ricerca. Infine, il Congresso offre a tutti l'opportunità di incrementare le collaborazioni con le molteplici realtà pubbliche e private in cui trovano spazio le competenze geologiche e di discutere le nuove strategie di sviluppo e di trasferimento tecnologico.

Il Congresso sarà anche l'occasione per riflettere sul ruolo delle Geoscienze per un futuro maggiormente sostenibile della Società e del Pianeta, sulla funzione che esse devono assumere nella formazione del cittadino, nella protezione dai rischi naturali e nella salvaguardia del patrimonio culturale e naturale che fanno dell'Italia un luogo unico.

Una particolare attenzione sarà rivolta ai giovani ricercatori, ai dottorandi e agli studenti mediante l'organizzazione di eventi ed incontri mirati alla creazione di reti di collaborazione per facilitare lo scambio interculturale e di informazioni per lo svolgimento delle proprie ricerche e la programmazione degli studi futuri.

Per iscriversi consulta il sito del CONVEGNO: https://geoscienze.org/torino2022/

Timetable Sessioni Scientifiche

		Gialla	Viola	Grigia	Arancione	TE8	Blu	TE9
19-set	Oral Sessions [1] 11.00 - 13.00	S24	S32	S10	S14	S19	S39	S43
	Oral Sessions [2] 15.30 - 17.30	S24	S33	S10	S14	S21	S37	S42
	Oral Sessions [3] 17.30 - 19.30	S4	S34	S10	S14	S21	S37	S45
20-set	Oral Sessions [4] 08.30 - 10.30	S3	S35	S9	S15	S22	S38	S44
	Oral Sessions [5] 11.00 - 13.00	S3	S35	S11	S16	S22	S48	S44
	Oral Sessions [6] 17.30 - 19.30	S3	S35	S12	S18	S20	S40	S41
21-set	Oral Sessions [7] 08.30 - 10.30	S2	S26	S7	S8	S31	S25	S30
	Oral Sessions [8] 11.00 - 13.00	S2	S26	S7	S8	S31	S47	S28
	Oral Sessions [9] 15.30 - 17.30	S5	S36	S29	S49	S46	S1	S13
	Oral Sessions [10] 17.30 - 19.30	S23	S36	S27	S17	S46	S1	S6

Sessioni CONVEGNO delle tre giornate del 19-20-21 settembre 2022

S1. Biominerals and environmental mineralogy

Biominerals in recent decades have received growing interest from a large interdisciplinary scientific community. Biominerals play a pivotal role in biogeochemical cycle of elements in the geological record. Thus, understanding (bio)mineralization processes in many different environments allows us to have a deep knowledge of natural risk, of the changes related to anthropic activities, of possible environmental resilience to such changes, and to provide tools for the risk assessment. Moreover, investigating (bio)minerals allows the development of technologies for environmental sustainability, and offers diverse and fairly numerous examples to devise useful biobased materials. This session is intended to strengthen the collaborative interaction among environmental mineralogists and is open to the whole scientific community interested in biominerals, sustainability and related technology development. The session acknowledges studies on biominerals at the molecular scale, the interface between minerals and organisms, the kinetics of (bio)mineral growth, communities of microbial and other organisms that individually or collectively drive biomineral processes. Moreover, this session invites contributions on minerals and their synthetic analogues relevant to the environment, biobased-environmental-technologies such as wetland systems, waste and water treatment, bio-metallurgy. Finally, investigations on biominerals relevant to health are also welcome.

Presentazioni orali

1-1 **15.30 - 15.45**

[KEYNOTE] Alisi C.*, Paganin P., Isca C., Tasso F., Medas D. & Birarda G. : Microbially induced calcite precipitation for environmental applications

1-2 **15.45 - 16.00**

Bordiga M.*, Gianoncelli A., Birarda G., Pollastri S., Bonanni V., Bedolla D.E., Vaccari L., Gariani G., Cerino F., Cabrini M., Beran A., Zuccotti M., Fiorentino G., Cobianchi M. & Lupi C. : X-ray Fluorescence and Infrared Spectroscopy analyses on fossil and cultured *Helicosphaera carteri* reveal silica presence within coccoliths

1-3 **16.00 - 16.15**

Buosi C.*, De Giudici G., Meneghini C., Medas D., Zuddas P., Iadecola A., Mathon O., Cherchi A. & Kuncser A.C. : Effects of Zn contamination on biomineralization processes of benthic foraminiferal tests

1-4 **16.15 - 16.30**
Dore E.*, Fancello D., Marras P.A., Medas D., Rigonat N., Vacca S., Alisi C., Paganin P. & Tasso F. : Effect of bioprecipitation of secondary minerals mediated by sulphate reducing bacteria (SRB) on metal mobility in mine impacted environment: preliminary data

1-5 **16.30 - 16.45**
Guido A.*, Alifano P., Talà A., Miriello D. & Belmonte G. : Unusual biomineralizaztions in an anchialine environment (Zinzulùsa cave, Castro, Italy)

1-6 **16.45 - 17.00**
Medas D.*, Lattanzi P., Meneghini C. & Podda F. : Hemimorphite-like phase bioprecipitation by *Leptolyngbya frigida* in a metal extreme environment

1-7 **17.00 - 17.15**
Montegrossi G.*, Venturi S., Crognale S., Casentini B., Amalfitano S., Baroni T., Rossetti S., Tassi F., Capecchiacci F., Vaselli O. & Fazi S. : Interplay between abiotic and biotic processes for travertine formation in a thermal spring system Interplay between abiotic and biotic processes for travertine formation in a thermal spring system

1-8 **17.15 - 17.30**
Pellegrini M.*, Farda B., Djebaili R., Vaccarelli I., Bernardini S., Ercole C., Bellatreccia F. & Del Gallo M. : Manganese oxides of caves: a multi-tool geomicrobiological approach to identify their origin and traits

1-9 **17.30 - 17.45**
[KEYNOTE] Vigliaturo R.*, Dražić G. & Gieré R. : Aberration-corrected electron microscopy and electron energy-loss spectroscopy applied to the characterization of Fe(II)-oxidizing bacteria-produced organo-mineral stalks

1-10 **17.45 - 18.00**
Bardelli F.*, Pacella A., Borelli V., Di Benedetto F. & Ballirano P. : The composition of asbestos bodies in human lungs

1-11 **18.00 - 18.15**
Capella S.*, Bellis D., Belluso E., Bullone M., Costa G., Ardit M. & Di Benedetto F. : Respirable crystalline silica (RCS) and feldpars: an unconventional harmful exposure scenario

1-12 **18.15 - 18.30**
Fornasaro S.*, Ciani F., Morelli G., Rimondi V., Lattanzi P., Cocozza C., Fioravanti M. & Costagliola P. : Mercury in chestnut tree-rings of the Monte Amiata area (Central Italy): impact of past mining activity and present-day geothermal power plants

1-13 **18.30 - 18.45**
Izzo F.*, Langella A., Gatta G.D., Germinario C., Grifa C., D'Antonio M., Di Meo M.C., Di Renzo V., Varricchio E., Salzano L.,

Lotrecchiano G., Saldutto P. & Mercurio M. : Pathological biomineralization: compositional and morphological classification of human urinary stones from the Campania region (southern Italy)

1-14 **18.45 - 19.00**
Perri E.* : Biomineralization processes in microbial communities: role of bacteria, extracellular polymeric substance and viruses

1-15 **19.00 - 19.15**
Ghani J.*, Dinelli E., Toller S. & Funari V. : Understanding the environmental impact and recoverability of untapped element from Municipal Solid Waste Incineration (MSWI) ashes

1-16 **19.15 - 19.30**
Linhares D.*, Pimentel A., Garcia P. & Rodrigues A. : Essential elements in the volcanic soils of São Miguel (Azores): linking geology to human and animal health

S2. Learning from the past for a sustainable future: geosciences in/for cultural heritage.

The research on geomaterials in cultural heritage (natural and artificial ones such as stones, mortars, ceramics, pigments, glass, etc…) is in constant evolution, focusing on the investigation of well-known as well as remote artworks or sites - monumental and archaeological - and opening questions addressable by means of a wide range of methodologies. Geosciences in cultural heritage can tackle many aspects, such as preventive maintenance, planning of conservation projects, study of artists technique and palette, retracing of historical trade routes, dating of artworks, investigation of technology of historical populations, etc… On the other hand, innovations in the application of geosciences for cultural heritage study are continuously developing. Analytical techniques and/or processing methods to obtain information are being implemented towards a minimally up to totally non-invasive approach. Moreover, digital access and presentation of objects and sites substantially increase accessibility of cultural heritage, promoting its valorisation. This session aims to stimulate discussions among the researchers involved in the interaction between geosciences and cultural heritage. It will collect the most recent updates including both case studies and research works, aimed to answer open research questions in the field.

Presentazioni orali

2-1 **08.30 - 09.00**
[KEYNOTE] Balassone G.* : Archaeometry and geosciences: the mission of the Center for Research on Archaeometry and Conservation Science (CRACS)

2-2 **09.00 - 09.15**
Fugazzotto M.*, Stroscio A., Mazzoleni P., Panella C., Russo A., Raneri S. & Barone G. : Ceramic technology and painting investigation of archaic architectural remains from the Palatine Hill in Rome

2-3 **09.15 - 09.30**
Paghi D.*, Manca R., Casalini M., Chiarantini L., Bragagni A., Tommasini S. & Benvenuti M. : Lead isotopic composition of maiolica made in the Florentine area between the 15th and 19th century

2-4 **09.30 - 09.45**
Verde M.*, De Bonis A., D'Antonio M., Renson V., Czujko S., Tomeo A. & Morra V. : Provenance study on ceramics from Cales (South Italy) using Sr, Nd and Pb isotopes

2-5 **09.45 - 10.00**
D'Uva F.*, De Bonis A., D'Antonio M., Manzo A. & Morra V. : The archaeometric study of pottery production from Southern Atbai Plain (Eastern Sudan)

2-6 **10.00 - 10.15**
Grima M.*, Cagno S. & Vella D. : A first archaeometric investigation of ancient glass found in Malta: glass groups, materials and degradation

2-7 **10.15 - 10.30**
Bertino A.*, Caggiani M.C., Fugazzotto M., de Ferri L., Baldan M., Tomaini B., Pojana G., Mangone A. & Barone G. : An innovative analytical approach to the study of pigments and minerals through the use of Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS) for cultural heritage applications

2-8 **11.00 - 11.15**
Belluso E.*, Capella S. & Siviero F. : Asbestos in cultural heritage: presence in antique and vintage objects and protocols for restauration and preservation

2-9 **11.15 - 11.30**
Vola G.*, Ardit M., Frijia G., Cavallo A., Natali C., Balma Mion C., Lugli F. & Primavori P. : Characterization and provenance of historical-contemporaneous marbles from the Waldensian valleys of Piedmont (Cottian Alps, Italy)

2-10 **11.30 - 11.45**
Medeghini L.*, De Vito C., Calzolari L., Capriotti S. & Mignardi S. : ON-Tech – Old New Technology in hydraulic mortars

2-11 **11.45 - 12.00**
Anfosso M.*, Gaggero L., Matteini M., Piquè F. & Vicini S. : The 2-step procedure with Di-ammonium phosphate to consolidate carbonate stones used in cultural heritage

2-12 **12.00 - 12.15**
Motta A.*, Occhipinti R., Finocchiaro C., Nucatolo G., Starinieri S. & Lazzara G. : Restoration works in a green perspective: the pavement of the “Palazzo Centrale dell’Università” (Catania, Sicily)

2-13 **12.15 - 12.30**
Di Luzio E.*, Carfora P. & Barberis W. : The MagicwHand and Audiobyke projects: following historical routes across the central Apennines for scientific research and development of sustainable tourism

2-22 **12.30 - 12.45**
Mirkovic N., Di Fazio M.*, De Vito C., Ciccola A., Capuani S., Stagno V. & Medeghini L. : A multi-analytical study of architectural fragments from the Marzamemi II “Church Wreck”

2-15 **12.45 - 13.00**
Ciriotti M.E.* : Sustainable mineralogical research - A new frontier.

S3. Geosciences for Cultural Heritage

Geosciences are nowadays widely applied to the study, monitoring, evaluation, conservation and fruition of the Cultural Heritage. This session solicits contributions from all the disciplines related to the Earth Sciences applied to natural and archaeological heritage sites and materials at different scales, from landscape to the microscope. Contributions of the most common geoscience fields applied to cultural heritage such as geology, geomorphology, geoarchaeology, geophysics, mineralogy, petrography and archaeometry are welcome. Particular interest will be given in interdisciplinary approaches integrating new experimental techniques, data acquisition and processing as well as case studies and innovative applications..

Presentazioni orali

3-1 **08.30 - 09.00**
[KEYNOTE] Angelucci D.E.* : Geoscience + Archaeology = Geoarchaeology

3-2 **09.00 - 09.15**
Amadio M.* & Bombardieri L. : Geoarchaeology of prehistoric Cypriot architecture. Integrated analyses of mudbricks from Middle Bronze Age Erimi

3-3 **09.15 - 09.30**
Bisciotti A.*, Comodi P., Fastelli M., Zucchini A. & Fiorini L. : Toward mediterranean inside transport amphoras. Manufactory, provenance and trades reconstruction from VII-VI B.C.

3-4 **09.30 - 09.45**
Calzolari L.*, Medeghini L. & Mignardi S. : Still functioning ancient Roman aqueducts: characterization of the mortars of *Aqua Traiana* and *Aqua Virgo*

3-5 **09.45 - 10.00**
Maritan L.*, Gravagna E., Cavazzini G., Mazzoli C., Usai D. & Salvatori S. : Strontium isotope analysis for pottery provenance studies along the Nile: does it work?

3-6 **10.00 - 10.15**
Leite Santos Y.*, Tema E., Gulmini M., Davit P., Elia D., Meirano V. & Fantino F. : A Roman kiln excavated at Costigliole Saluzzo connects archaeological, archaeometric and archaeomagnetic investigations

3-7 **10.15 - 10.30**
Pieruccini P.*, Sardella R., Mecozzi B., Forti L., Lanci L., Tema E., Lembo G., Muttillo B., Iannucci A., Bona F., Russo Ermolli E., Sadori L., Sigari D. & Mazzini I. : Geoarchaeology and old paradigms: revising Grotta Romanelli's significance for Mediterranean Palaeolithic

3-8 **11.00 - 11.15**
Morsilli M.* & Gianolla P. : Gargano Promontory (Apulia, Italy): a natural aspiring candidate for the UNESCO Global Geoparks network

3-9 **11.15 - 11.30**
Chimento F., Tusberti F., Brandano M., Breda A., Massironi M., Perissinotto M.L., Tomassetti L. & Preto N.* : Assessing geodiversity and the potential for a new geopark – The case study of Lumignano and Costozza (Berici Hills, northeastern Italy)

3-10 **11.30 - 11.45**
Zampieri D.*, Roghi G. & Dalconi M.C. : Borcola pass geosite proposal (Italian Pre-Alps)

3-11 **11.45 - 12.00**
Masseroli A.*, Fracasetti L. & Trombino L. : Soil trail as tool to promote geo- and cultural- heritage

3-12 **12.00 - 12.15**
Morino C.*, Coratza P. & Soldati M. : The importance of landslides in the global geological heritage

3-13 **12.15 - 12.30**
Mariani G.S.*, Brandolini F. & Melis R.T. : Using landscape features to understand Bronze Age spatial occupation strategies (Sardinia, Italy)

3-14 **12.30 - 12.45**
Forti L.*, Brandolini F., Oselini V., Peyronel L., Pezzotta A., Vacca A. & Zerboni A. : Geomorphological tools to assess the preservation of the archaeological record of tell-sites in the Kurdistan Region of Iraq

3-17 **12.45 - 13.00**
Tufano R.*, Guerriero L., Annibali Corona M., Cianflone G., Di Martire D., Ietto F., Novellino A., Rispoli C., Zito C. & Calcaterra D. : Multi-scenario approach for flood hazard assessment of Sybaris archaeological site (Calabria region, Italy)

3-16 **17.30 - 17.45**
Mattia M.*, Barone P.M., Facchin G., Narducci R., Portaro M., Rustico L., Soligo M., Tuccimei P., Wueste E. & Bellatreccia F. : The use of innovative, non-invasive and non-destructive methodologies for the survey of buried archaeological structures: the case study of S. Balbina in Roma (Italy)

3-15 **17.45 - 18.00**
Melada J.*, Arrigoni F., Conforto A., Pigazzi E., Apuani T., Giudici M. & Ludwig N. : Multi-analytical survey for the conservation and valorization of geoheritage: the case study of the Parco Archeologico-Botanico del Paradiso in Chiavenna (SO)

3-18 **18.00 - 18.15**
Randazzo V.*, Todaro S., Provenzale S., Di Dio V. & Di Stefano P. : Geoconservation in Sicily (Italy): the example of the Isola delle Femmine (Palermo)

3-19 **18.15 - 18.30**
Garuti L.*, Corrado S., Cifelli F. & Trippanera D. : Widespread Science Museums for the development of a sustainable life strategy in urban areas: an application to the city of Rome

3-20 **18.30 - 18.45**
Falcone F.*, Stoppa F., Guglielmelli F., Belfiore V. & Rosatelli G. : Assessment of mitigation measures and risk scenario of the museum collections: an application to the National Archaeological Museum Villa Frigerj in Chieti (Central Italy)

3-21 **18.45 - 19.00**
Pasquaré Mariotto F.*, Bonali F.L. & Venturini C. : Iceland, an Open-Air Museum for Geoheritage and Earth Science Communication Purposes

3-22 **19.00 - 19.15**
Sánchez Fabián J.A.* & Salman Monte K. : Geoparks as tools for communicating geoscience: A local approach to understand the importance of geology in cultural heritage and human activities

3-23 **19.15 - 19.30**
Bajni G.*, Apuani T. & Sterlacchini S. : The contribution of Geosciences in teaching of Civic Education in secondary schools: experiences of Citizen Science & Engagement in the context of the National Strategies for Sustainable Development (Strategie Aree Interne Valchiavenna)

S4.Minerals, rock and museum: from collection to research in a post-pandemic world

Museums and University geological collections are a hidden treasure to be supported and enhanced by the geological and naturalist community. The value of the geological collections is not limited to preserve important materials from historical or scientific point of view or from lost mining and geological localities, but should be the starting point to promote and communicate science and particularly geology. The collections are “archives of memory” of invaluable geological heritage and require appropriate conservation and protection, as well as laboratories to restore and study it, in order to preserve them for the future generations. For this reason, collections should also be constantly updated by findings in Italy and worldwide. Naturalistic Museums and University collections should also be propulsive centres and play a social role as a place of contact between researchers, amateurs, and administrators. This session aims to collect all the contributions that wish to promote the geological, mineralogical and paleontological collections and discuss issues related to their preservation and improvement, as well as their role on the dissemination and communication of geology at every level. Finally, new ideas for a more sustainable economic, environmental and social development of museum collections are also welcome.

Presentazioni orali

4-1 **17.30 - 17.45**
[KEYNOTE] Ferraris C.* : Mineralogy, minerals and collections at the National Museum of Natural History of Paris

4-2 **17.45 - 18.00**
(Invited) Welch M.D.* : Mineralogical crystallography at the Natural History Museum, London: a personal perspective on past, present and future directions of geoscience research at museums

4-3 **18.00 - 18.15**
(Invited) Skogby H.* : Museum collections as a facility for geological research and outreach – Some examples from the Swedish Museum of Natural History

4-4 **18.15 - 18.30**
Macrì M.* : University Earth Sciences Museums: a SWOT analysis

4-5 **18.30 - 18.45**
Franza A.*, Mattes J. & Pratesi G. : *Collectio Mineralium* (1765): recovering a lost mineralogical catalog

4-6 **18.45 - 19.00**
Senesi M.* & Costa E. : Mineralogical and Petrographic collections preserved in Regional Museum of Natural Sciences of Turin

4-7 **19.00 - 19.15**
Fioretti G.*, Eramo G., Monno A. & Muntoni I.M. : Strategies for enhancement and promotion of SiLiBA, the lithotheque of the University of Bari (Italy)

4-8 **19.15 - 19.30**
Barone G.*, Mazzoleni P., Fugazzotto M., Lanzafame G., Sinitò D., Stanco F., Tricomi A., Santagati C., Galizia M., Treffiletti A., Lombardo C., Rizzo C. & Coccato A. : DREAMIN, an HUB for the Digital REmote Access of Museum and INfrastructures

S5. Sustainability in dimension and ornamental stones industry (from exploitation to application)

Dimension and ornamental stones were extensively used (and still are) for buildings and infrastructures in areas interested by quarrying activity. Here, stones are elements of geodiversity that connect the natural environment to the city, which often represents a continuum with the surrounding geology and landscape. This ex-situ geodiversity deserves preservation, conservation and promotion in line with the environmental, social and economic goals of sustainability. Quarries and working plants are often in the same areas, representing important items for local social and economic development. Sustainable exploitation of the natural resource must be planned, by reducing extractive waste production, recycling waste in different productive cycles, saving energy consumption, lowering emissions, etc. The physical-technical and minero-petrographic properties of stones used in historical buildings should be taken into account in the modern architecture in a sustainability perspective. Vernacular traditional architecture, e.g., could be a model for buildings with cohesive sustainable specifications related to local construction materials and energy reduction. We welcome any contributions on dimension and ornamental stones as Heritage Stones, geodiversity elements, on the environmental impact of stone extraction and its mitigation, on the processes of stone transformation, on stone degradation in historical buildings and on its sustainable use in modern architecture.

Presentazioni orali

5-1 **15.30 - 15.45**
[KEYNOTE] Careddu N.* : Marble quarries sustainability: from scraps to high value-added products

5-2 **15.45 - 16.00**
(Invited) Pereira D.* : Heritage Stones: the cultural value of natural stones that needs to regain recognition

5-3 **16.00 - 16.15**
Sena do Nascimento J.A., Castro F.F. & Castro N.* : Assessment of SDG indicators applied to the natural stones cluster in the state of Espírito Santo in Brazil: a step towards sustainable development

5-4 **16.15 - 16.30**
Duarte J.*, Gomes A., Costa F. & Barbosa R. : The use of geotechnologies in the sustainable exploitation of geological resources applied to conservation, restoration and structural reinforcement works

5-5 **16.30 - 16.45**
Primavori P.* : Stone splitting: the oldest sustainable processing technology

5-6 **16.45 - 17.00**
Milizia E.*, Brandano M., Cornale P., Mazzoli C., Perissinotto M.L., Preto N. & Tomassetti L. : Vicenza Stone: nomination as Global Heritage Stone Resource

5-7 **17.00 - 17.15**
Cavallo A.* : Soapstones from Valmalenco (Sondrio, central Alps): from archeology to modern uses

5-8 **17.15 - 17.30**
Signori G.* & Angheben A. : Urban stone paving: identity, durability and sustainability. Some cutting-edge cases studies and experiences

S6. Palaeomagnetism, Rock Magnetism and Magnetostratigraphy

The study of the remanent magnetization of rocks, sediments and human artifacts can offer precious information about their formation, deposition and use and can be applied in various fields of Earth Sciences. In this session we welcome contributions related to the investigation of the Earth's magnetic field in various spatial and temporal scales, to the use of rock magnetism and magnetic anisotropy to solve problems related to geological, geophysical

and tectonic processes and to the application of magnetostratigraphy to date and correlate sedimentary sequences. We also solicit contributions that apply palaeomagnetic and rock magnetic techniques on various research fields such as geology, archaeology, volcanology, sedimentology, environment and paleoclimate.

Presentazioni orali

6-1 17.30 - 17.45
(Invited) Pavón-Carrasco F.J.* : Reconstructing the past Earth's magnetic field through rocks

6-2 17.45 - 18.00
Tarduno J.*, Cottrell R. & Bono R. : A Late Cretaceous true polar oscillation artifact: further evidence for Earth's long-term rotational stability

6-3 18.00 - 18.15
Perini S.*, Muttoni G., Monesi E., Melis R.T. & Mussi M. : Magnetochronology and age-depth depositional models of the Melka Kunture archeological area (Upper Awash, Ethiopia)

6-4 18.15 - 18.30
Maron M.*, Onoue T., Satolli S., Soda K., Sato H., Muttoni G. & Rigo M. : Increased weathering and anoxic conditions in the late Norian-early Rhaetian interval from rock magnetism and geochemistry of Pignola-Abriola (Italy) and Kiritihere (New Zealand) sections

6-5 18.30 - 18.45
Srivastava P.*, Sangode S.J., Torrent J., Florindo F. & Jovane L. : Iron oxide characterization of a deeply weathered high-land lateritic profile from the Deccan Traps: Implications to autochthonous alteration and allochthonous input

6-6 18.45 - 19.00
Chadima M.*, Hrouda F. & Ježek J. : Anisotropy of out-of-phase magnetic susceptibility of rocks and environmental materials

6-7 19.00 - 19.15
Robustelli Test C.*, Biedermann A.R., Zanella E. & Festa A. : Lithology-dependent magnetic fabric in intraplate shear zones in the Northern Apennines, Italy: Constraints from para- and ferromagnetic fabrics

6-8 19.15 - 19.30
Siravo G.*, Speranza F., Mulas M. & Costanzo-Alvarez V. : Paleomagnetism of volcanics from the Ecuadorian Andes constrains the significance of Tertiary northern Andean Block extrusion and genesis of the Interandean Valley

S7. Quantitative geology and modeling: an excursion through analogue and numerical modeling and the digital reproduction of outcrops

Digital outcrop models (DOM) are becoming a routine way to collect geological data in the field, thanks to the increasing affordability of good quality cameras, unmanned aerial vehicles (UAV) and GPS systems, and the availability of effective and user-friendly photogrammetry software. The phases going from field survey, DOM reconstruction to data extraction and analysis can be faced using different approaches depending on the characters of the outcrops and on the geological problem investigated. Data extraction is a critical bottleneck in this process because it is often a time-consuming manual process, and its automation is still an open field of research. Here, we welcome contributions including (i) methodological studies about all the phases from photogrammetric survey design, model reconstruction, interpretation, the automation of geological data extraction and their statistical analysis, and (ii) geological case studies based on the DOMs. Early-career scientists and students are particularly encouraged to submit a contribution.

Presentazioni orali

7-1 **08.30 - 08.45**

[KEYNOTE] Ortolano G.* : The quantitative microstructural analysis of mylonitic rocks: the numerical computation of the Earth moving view

7-2 **08.45 - 09.00**

Massaro L.*, Adam J. & Yamada Y. : Analogue modelling of fault and fracture processes at the outcrop scale: insights from the application of new granular materials in dynamically scaled experiments

7-3 **09.00 - 09.15**

Gambino S.*, Barreca G, Gross F., Monaco C. & Gutscher M.-A. : Coexistence of brittle and ductile deformation in the Western Ionian Basin as highlighted by seismic data analysis and sequential restoration methods

7-4 **09.15 - 09.30**

Manna L.*, Maino M., Casini L., Dabrowski M. & Reali A. : On the relation between the frictional strength of a fault and the presence of structural voids and weak phyllosilicates in the host rock: a numerical approach

7-5 **09.30 - 09.45**

Gayrin P.*, Maestrelli D., Corti G. & Del Ventisette C. : Reactivation of inherited faults in rift settings: insight from analogue study

7-6 **09.45 - 10.00**
Muller V.A.P.*, Sternai P., Sue C., Valla P. & Simon-Labric T. : Climatic control on the location of magmatic arcs

7-7 **10.00 - 10.15**
Vessia G.*, Faraone C., Caravaggio S., Rainone M.L., Conoscenti C., Mixco L. & Ramos Castillo A.L. : 2D numerical simulations of local seismic response at San Salvador (El Salvador) urban center

7-8 **10.15 - 10.30**
Primofiore I.*, Baron J., Klin P., Vessia G. & Laurenzano G. : From the costruction of the 3D model to local seismic response analysis

7-9 **11.00 - 11.15**
Casiraghi S.*, Bistacchi A., Arienti G., Cannella C., Dal Piaz G. & Monopoli B. : Assessing the accuracy and density of photogrammetric point clouds reconstructed by different open-source and commercial software

7-10 **11.15 - 11.30**
Volatili T.*, Di Celma C., Pitts A., Pierantoni P.P. & Mazzoli S. : UAV-based digital outcrop modelling in adverse conditions: the case study of the Canyon Gramonal (Ica desert, Peru)

7-24 **11.30 - 11.45**
Occhipinti M.*, Amorini S. & Porreca M. : Remote Sensing Analysis for Detection of Ground Deformation induced by Large Earthquakes: A First Approach using Copernicus Opensource Dataset

7-12 **11.45 - 12.00**
Fazio E.*, Druguet E. & Carreras J. : A useful method for a quick terrestrial digital acquisition of rock outcrops: an example from the Cap de Creus area (Spain)

7-13 **12.00 - 12.15**
Mercuri M.*, Tavani S., Aldega L., Trippetta F., Bigi S. & Carminati E. : Multiscale characterization of a fracture network using NetworkGT and open-source aerial images: the Kuh-e-Asmari anticline case study in Zagros Mts., Iran

7-14 **12.15 - 12.30**
Torre D.* & Menichetti M. : AFATA (Active FAult Tectonic Analysis): a semi-automatic tool on ArcGIS® for estimating fault offsets on superficial ruptures

7-15 **12.30 - 12.45**
Sleath P.R.*, Butler R.W.H. & Bond C.E. : Thrust Fault Localisation in Multilayers – outcrop tests of idealised models

7-16 **12.45 - 13.00**
Fazio E.*, Forzese M., Maniscalco R. & Punturo R. : 3D virtual models for geo-educational purposes

S8. Perspectives on fluid- and melt-rock interactions by advanced thermodynamics and geochemistry: applications in petrology and geothermy

Crustal fluid migration is an important process that affects subsurface plumbing systems, local stress kinematics, promoting the heat and elements transport with crucial implications for resource management and energy/environment sectors. Groundwater, hydrothermal brines and gases circulating in the subsurface interact with local structures across different tectonic and geological settings. Surface manifestations of upwelling fluids include hydrothermal systems, sedimentary- (or mud-) and hybrid- volcanism and cold seeps located onshore and offshore. Investigating the mutual interaction that fluids have with local geological structures provide an excellent opportunity to have an open window to study crustal processes. At depth, the interplay between fluid migration and host-rocks is characterized by complex sedimentary deformation and geochemical reactions where life can adapt to thrive in extremely harsh environments. These unique subsurface settings provide the opportunity for the development and management of economic resources (geothermal, CO2 geological storage, ore materials extraction from thermal brines and deposits, groundwater supply, energy storage, etc). This session encourages contributions from a broad range of disciplines on active and paleo systems that include geophysical, geochemical, microbial, geological, numerical and laboratory studies to foster a better understanding of modern and paleo fluid-driven systems in the upper crust.

Presentazioni orali

8-1 **08.30 - 08.45**
Piccoli F.* & Rubatto D. : Petrochronology of chlorite-schists reveals the timing of serpentinites dehydration and metasomatism: new insights from the Zermatt-Saas ophiolite

8-2 **08.45 - 09.00**
Tursi F.* : Investigating chemical potential gradients to decipher microstructures and mineral assemblages in mylonites

8-3 **09.00 - 09.30**
[KEYNOTE] Schorn S.* : Using the “other” variables in phase equilibrium modelling – enthalpy, activity and chemical potentials as controlling agents in metamorphism

8-4 **09.30 - 09.45**
Siron G.*, Vitale Brovarone A. & Matthews S.M. : Development of a Python GUI application to automate EQ3/6 thermodynamic computations

8-5 **09.45 - 10.00**
Nerone S.*, Groppo C. & Rolfo F. : Forward thermodynamic modelling of the uncommon chloritoid + biotite + garnet assemblage: interplay between equilibrium and kinetics

8-6 **10.00 - 10.15**
Mazzucchelli M.L.*, Moulas E., Kaus B. & Speck T. : The influence of non-hydrostatic stress on mineral equilibria: insights from molecular dynamics

8-7 **10.15 - 10.30**
Agostini S.*, Braschi E., Conticelli S., Di Giuseppe P., Francalanci L., Innocenzi F., Lustrino M. & Manetti P. : Deciphering Active Arc vs. post-collisional calc-alkaline magmatism through B and radiogenic isotope data in Aegean-Anatolian Region

8-8 **11.00 - 11.15**
Borghini A.*, Borghini G. & Ferrero S. : Melt-rock reaction experiments constrain the nature of crust-mantle interaction during the subduction of the continental crust at mantle depth

8-9 **11.15 - 11.30**
Malaspina N.*, Borghini G., Zanchetta S., Corti M. & Tumiati S. : Melt-peridotite interaction at high pressure during subduction: the case study of Borgo (Mt. Duria, Central Alps, Italy)

8-10 **11.30 - 11.45**
[KEYNOTE] Tamblyn R.*, Hand M., Morrissey L., Anczkiewicz R., Zack T., Phillips G. & Och D. : The petrological record of eclogite cycling in an oceanic subduction channel from eastern Australia

8-11 **11.45 - 12.00**
Tumiati S.*, Tiraboschi C., Sverjensky D.A., Manning C.E., Vitale Brovarone A., Boutier A. & Poli S. : Oxidation of subducted organic matter buffered by marine carbonate rules the carbon isotopic signature of arc emissions

8-12 **12.00 - 12.15**
D'Orazio M.*, Fulignati P., Gioncada A. & Cavalcante F. : Evidence of Na-metasomatism of phyllite rocks from the Verrucano of Monti Pisani (Tuscany, Italy)

8-13 **12.15 - 12.30**
Feng W.*, Yao L., Gomila R., Ma S. & Di Toro G. : Healing of gabbro and basalt experimental faults under hydrothermal conditions

8-14 **12.30 - 12.45**
Lima A.* : Multiple immiscible liquids formation at shallow Somma-Vesuvius volcanic system

8-15 **12.45 - 13.00**
Marchesini B.*, Tavani S., Mercuri M., Aldega L., Mondillo N., Pizzati M., Balsamo F. & Carminati E. : Structural and permeability evolution in the lithocap of a fossil geothermal system (Allumiere quarry, northern Latium, Italy)

S9. Ground deformation measurements and Geosciences: applications and outlooks

Ground deformation is one of the few directly observable expressions of the majority of the geophysical and geomorphological phenomena. Free availability of short revisit time data from recent SAR satellite missions, long GNSS time series, advances in computational performances for data processing and modelling, allow to characterize a lot of natural phenomena at hundreds kilometers to few meters spatial scale and millimeters- to meters-per-year rates. In this session we host contributions giving an updated overview of the progress in ground deformation measurement applications, spanning from the hazard detection, to mapping, monitoring, modelling and forecasting, from one to multi-disciplinary efforts, from building to regional scale. Welcame contributions concern: - Landslides and subsidence mapping, activity definition, and susceptibility assessment - Volcanoes dynamics (e.g. unrest, eruption cycle, and flank instabilities) - Tectonic deformation and co- and post-seismic ground motion - Subsidence detection and modeling for flooding scenarios - Ground deformation data for operational monitoring and decision support systems (e.g. land use planning; early warning; hazard assessment) - Man-made activity monitoring (mine activity, dams stability, quarries, Gas storage; Oil&Gas production; or Underground water extraction).

Presentazioni orali

9-1 **08.30 - 08.45**
Festa D.*, Confuorto D., Del Soldato M., Raspini F. & Casagli N. : Automated assessment of InSAR-based ground displacements at large scale

9-2 **08.45 - 09.00**
Khalili A.M.*, Guerriero L., Pouralizadeh M., Calcaterra D. & Di Martire D. : Monitoring and Prediction of deformation caused by Landslides Based on Graph Convolutional Network and SAR Imagery

9-3 **09.00 - 09.15**
Medici C.*, Confuorto P., Del Soldato M., Rosi A., Segoni S. & Casagli N. : Machine Learning for assessing the spatial probability of trend variations of InSAR-based ground deformations

9-4 **09.15 - 09.30**
(Invited) Solari L.* & Crosetto M. : Copernicus and ground motion: the European Ground Motion Service

9-5 **09.30 - 09.45**
Trasatti E.* : Volcanic and Seismic source Modelling (VSM) - An open tool for geodetic data modelling

9-6 **09.45 - 10.00**
Linsalata F.*, Melini D. & Spada G. : Ongoing sea-level rise and vertical land movements in the Venetian Lagoon: the contribution of Glacial Isostatic Adjustment

9-7 **10.00 - 10.15**
Castaldo R., Solaro G.* & Tizzani P. : Inflating Source Imaging of the 2009–2013 Unrest Episode at Campi Flegrei Caldera revealed through GPS and DInSAR measurements

9-8 **10.15 - 10.30**
De Stefano R.*, Calcaterra D., Di Martire D., Fiorino A., De Marco S. & Russo G. : Comparing DInSAR and ground-based monitoring measurements of a rockfill dam during its first impoundment

S10. Evolution of collisional orogens in space and time: the Alpine-Himalayan system in 4 dimension

Continental plates collisions give rise to collisional-related mountains that are some of the most spectacular and dominant features of our Planet. During collision of continental plates, considerable deformation occurs with large scale overthrusting, burial and metamorphisms of continental lithosphere portions. The final anatomy and the shape of collisional belts are highly diverse, due to the interactions of several controlling factors, including the pre-collisional tectonic history, the rate and the angle of convergence, the mechanical strength and thermal state of the involved colliding plates. The youngest collisional system on the Earth is the Alpine-Himalayan belt, extending from Spain to Southeast Asia. Its general structure was pioneering described by Emile Argand in "La tectonique de l'Asie. On the occasion of the centenary of Argand work, presented during the XIII International Geological congress in Belgium (August 10, 1922), we propose a thematic session with the aim of providing an update view on the Alpine-Himalayan geology. We encourage the submission of multidisciplinary contributions, dealing with the reconstruction of the tectonics architecture, at different scales (from satellite to micro-and nanoscale), the tectono-metamorphic evolution integrating leading edge petrological or numerical modelling, petrochronology and thermochronology, of the Alpine-Himalayan system.

10-1 **11.00 - 11.30**
[KEYNOTE] Ballèvre M.* : HP/UHP rocks in the Western Alps : acquiring new (robust) data, constraining old (fashionable) models

10-2 **11.30 - 11.45**
Nosenzo F.*, Manzotti P. & Robyr M. : Rehydration of Variscan upper crust prior to its Alpine reworking as revealed by polycyclic garnet (Dora-Maira Massif, Western Alps)

10-3 **11.45 - 12.00**
Maino M.*, Schenker F.L., Casini L., Corvò S., Perozzo M., Langone A. & Seno S. : Challenges in the interpretation of the metamorphic record in compositionally heterogeneous shear zones - insights from the Central Alps

10-4 **12.00 - 12.15**
Sanità E.*, Di Rosa M., Lardeaux J.M., Marroni M. & Pandolfi L. : Structural evolution and Pressure-Temperature-path of the Moglio-Testico Unit (Western Ligurian Alps): a re-appraisal

10-5 **12.15 - 12.30**
Tagliaferri A.*, Schenker F.L., Schmalholz S.M., Ulianov A. & Seno S. : Investigating the time of deformation and heat transfer in the Lepontine Dome (Central European Alps)

10-6 **12.30 - 12.45**
Malusà M.G.*, Guillot S., Zhao L., Paul A., Solarino S. & CIFALPS Working Group : The deep structure of the Western Alps revealed by the CIFALPS seismic experiments

10-7 **12.45 - 13.00**
Schmid S.M.* : Imaging crust and mantle structure of the Western Alps by geophysical methods: controversies regarding the geological interpretation of the deep structure of the Western Alps

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Aula Grigia

10-8 **15.30 - 16.00**
(Invited) Imayama T.*, Hoshino R., Yi K. & Kawabata R. : Eocene to Miocene metamorphic evolution and tectonic implication of the Ilam Nappe in Nepal Himalaya: Constraints from P–T conditions and monazite petrochronology

10-9 **16.00 - 16.15**
Tamang S.*, Groppo C., Rolfo F. & Girault F. : Aluminous metapelites as a key to constraining the P-T evolution of the Upper Lesser Himalayan Sequence (Central Nepal)

10-10 **16.15 - 16.30**
Carano G.*, Montomoli C., Iaccarino S. & Carosi R. : Assembly and exhumation of GHS driven by the in-sequence shearing in the Annapurna Range, central-western Nepal

10-11 **16.30 - 17.00**
(Invited) Todrani A.*, Speranza F., D'Agostino N. & Zhang B. : From Greater India indentation to Eastward Tibet flow: a comparison between paleomagnetic and GPS data

10-14 **17.00 - 17.15**
Festa V., Fornelli A., Micheletti F., Spiess R. & Tursi F.* : Records of high-P (eo-)Alpine tectono-metamorphic events in the Variscan lower crust of the Serre Massif (Calabria, southern Italy)

10-19 **17.15 - 17.30**
Frasca G.* & Manatschal G. : A kinematic reconstruction of the Western Tethys based on the tight fit restoration of the southern N-Atlantic and the “building-block” approach

10-13 **17.30 - 18.00**
(Invited) Simonetti M.* : Low-temperature deformation in the Argentera Massif: distinction between Alpine and Variscan tectonics

10-15 **18.00 - 18.15**
Arienti G.*, Bistacchi A., Dal Piaz G.V., Dal Piaz G., Monopoli B. & Bertolo D. : A new 3D structural model of the North-Western Alps: the Aosta Valley case study (Italy)

10-16 **18.15 - 18.30**
Bistacchi A.*, Dal Piaz G.V., Arienti G., Dal Piaz G., Monopoli B. & Bertolo D. : Topological analysis reveals 1st order kinematics and relative chronology of major tectonic boundaries in the NW Alps

10-17 **18.30 - 18.45**
Pantet A., Epard J.-L.*, Baumgartner-Mora C., Baumgartner P., Baumgartner L. & Masson H. : The “Schistes Lustrés” in the Mont Fort and Tsaté nappes (Middle and Upper Penninic, Western Swiss Alps)

10-18 **18.45 - 19.00**
Maffeis A.*, Nerone S., Corno A., Caso F. & Petroccia A. : The Western Alps exhumation history detailed through the eyes of glaucophane-bearing eclogitic rocks: preliminary metamorphic data from the Internal Piedmont Zone

10-20 **19.00 - 19.15**
Menichelli I.*, De Gori P., Improta L., Lucente F.P. & Chiarabba C. : 3D Vp and Vp/Vs tomographic models of the central Mediterranean area: new insights into the deep structure of the Alpine-Apennine system

10-21 **19.15 - 19.30**
Gusmeo T.*, Schito A., Cavazza W., Corrado S., Zattin M., Alania V., Enukidze O. & Pace P. : Contrasting subsidence-exhumation patterns in the hinterland of the Africa-Eurasia collision zone: the eastern Adjara-Trialeti, western Kura and central Greater Caucasus inverted sedimentary basins (Georgia)

S.11 Composition and evolution of the oceanic lithosphere: a petrological, geochemical and geodynamic perspective

At mid-oceanic ridges, continuous seafloor spreading and accretion of the oceanic lithosphere is a fundamental process in the dynamic cycle of Earth evolution. Mid-ocean ridges are key sites to investigate adiabatic mantle melting and magmatic, tectonic and hydrothermal processes leading to the accretion of oceanic crust. Notably, the oceanic lithosphere is characterized by a strong architectural variability, resulting from a complex interplay between spreading rate, melt supply, composition of the upwelling mantle and its potential temperature. These parameters critically control the degree of mantle melting, as well as the lithospheric and crustal thicknesses, the composition and distribution of upwelling melts, the cooling rate, melt transport and high- to low-temperature deformation processes. A multi-disciplinary perspective, combining geological, geophysical, and petro-geochemical approaches, is fundamental to unravel the processes occurring beneath the mid-ocean ridges, in turn improving our knowledge of this complex system. This session calls for studies on both modern and fossil oceanic lithosphere, bringing constraints on mantle processes, melt transport and oceanic crust accretion. Contributions on deformation,

hydrothermal circulation and cooling of the oceanic lithosphere are also warmly welcomed. Furthermore, we encourage broader discussions on the architecture and geodynamic evolution of divergent oceanic settings.

Presentazioni orali

11-1 **11.00 - 11.30**
[KEYNOTE] Cannat M.*, Chen J. & Olive J.A. : Crustal construction in magmatically robust slow spreading ridge settings

11-2 **11.30 - 11.45**
Grammatica M.*, Fumagalli P., Borghini G. & Capitani G. : The role of melt/olivine ratio in dissolution and reactive crystallization: an experimental and microstructural study (Electron Back-Scattered Diffraction-EBSD) at 0.5 GPa

11-3 **11.45 - 12.00**
Maia M.*, Briais A., Petracchini L., Cuffaro M., Ligi M., Brunelli D., Grenet L. & Hamelin C. : Tectonic deformation and variable magma supply along the Mid-Atlantic Ridge axis south of the Romanche transform fault

11-4 **12.00 - 12.15**
Ficini E.*, Cuffaro M., Ligi M. & Miglio E. : Numerical modelling of a curved Mid-oceanic ridge with oblique kinematics along the Knipovich-Mohns segment (Arctic Ocean)

11-5 **12.15 - 12.30**
(Invited) Boschi C.* : Serpentinization of Oceanic Peridotites: implication for geochemical cycles and carbon sequestration

11-6 **12.30 - 12.45**
Montanini A.*, Tribuzio R., Rumbolo T. & Bosch D. : Chemical and Nd-Hf isotope heterogeneity in depleted mantle domains from the Alpine-Apennine ophiolites

11-7 **12.45 - 13.00**
De Togni M.*, Gattiglio M. & Balestro G. : Pre-Alpine oceanic tectonostratigraphy of the high-pressure Lanzo Valleys Ophiolites (Viù Valley, Western Alps)

S.12 Growth, recycling and differentiation of the continental crust

The continental crust mainly grows by addition of mantle-derived magmas. Nevertheless, its final architecture, bulk composition and lithological diversity during Wilson's cycles is the result of the interplay of repeated and superposed magmatic, metamorphic and tectonic events. These events involve: recycling of subducted crust within the mantle wedge, and related magmatism; anatexis to form plutonic bodies in the middle-upper crust and residual granulites

in the lower crust; juxtaposition of tectono-metamorphic units; development of oriented fabrics in low- to high-T metamorphic rocks and plutons. Recent advancements in these fields figure out the feedback among tectonics, magmatism and metamorphism, and prompt new views on segregation-to-emplacement mechanisms and lifespan rates of igneous batches from their deep cradle to shallow grave. Here, the final gift of magmas to humankind are heat sources for geothermal systems and hydrothermal deposits. This session aims at bringing together contributions to better understand the different roles played by mantle- and crust-derived magmatism, metamorphism and tectonics in shaping the continental crust, as well as the different mechanisms and timescales with which these processes operate. Contributions based on a multidisciplinary approach, mingling and mixing field, micro-structural, petrological, geochemical and geochronological data, with thermodynamic, analogic or numerical modelling are all welcome.

Presentazioni orali

12-1 **17.30 - 17.45**
(Invited) Caricchi L.* : Quantifying crustal magma fluxes to unveil their role on volcanic activity, growth of differentiation of the crust and the formation of ore deposits

12-2 **17.45 - 18.00**
Mosconi A.*, Tiepolo M., Farina F. & Cannaò E. : Geochemistry and geochronology of the Corno Alto complex (Adamello batholith): evidence for a multi-stage and multi-component process

12-3 **18.00 - 18.15**
Groppo C.*, Rolfo F. & Frezzotti M.L. : The contribution of calcareous pelites in shaping the continental crust: prograde metamorphism, fluid production and melt (un)fertility

12-4 **18.15 - 18.30**
Caso F.* : Permian evolution of the lower continental crust: the example of the Valpelline Unit in the Austroalpine Domain (Western Alps, Italy)

12-5 **18.30 - 18.45**
Gianola O., Costa B., Alvaro M., Gilio M., Ferri F. & Cesare B.* : Origin of felsic melts by anatexis of arclogites in arc roots: an example from Mercaderes, Colombia

12-6 **18.45 - 19.00**
Ferrero S.*, Nicoli G., Darling R., Yakymchuk C., Wunder B. & Tollan P.E. : Melting the mafic crust: multiple anatectic events at Hooper mine, Adirondacks (New York State US)

12-7 **19.00 - 19.15**
Carvalho B.B.*, Cesare B., Bartoli O., Satish-Kumar M., Petrelli M., Kawakami T., Hokada T. & Gilio M. : Probing the hottest melts from Earth's continental crust

12-8 **19.15 - 19.30**
Bartoli O.* : Use and misuse of geochemical records to decipher fluid regime during crustal melting

S.13 Earth dynamics to dynamic landscape: feedback between tectonics and landscape evolution

Deep-Earth forcings (e.g., mantle flow) drive shallower lithospheric-to-crustal deformations (e.g., plate tectonics), defining the main stages of the geodynamic evolution. This is reflected in the creation of dynamic topography, which in turn drives transient tectonic and geomorphic processes including faulting, river incision, fluvial knickpoints migration, dynamic drainage divides, erosion, and sedimentation. Although coupling between tectonic and surficial processes has been explored at many scales, many challenges remain in understanding how geomorphic markers and processes encode crustal deformation driven specifically by dynamic topography. Closing this knowledge gap is the starting point pivotal to many studies including but not limited to mantle upwelling, isostasy, salt doming, intraplate tectonics, and forearc migration. We invite contributions addressing these issues by applying multidisciplinary approaches and crossing canonical disciplines' boundaries. Research carried out along active plate boundaries or continental interiors are welcome in this session. Results from field-based, analogue and numerical investigations, supported also by thermo- and geochronological data are welcome.

Presentazioni orali

13-1 **15.30 - 15.45**
[KEYNOTE] Siravo G.*, Becker T.W., Faccenna C., Fellin M.G., Gérault M., Herman F., Molin P. & Sembroni A. : Tectonically driven drainage reorganization in the Eastern Cordillera, Colombia

13-2 **15.45 - 16.00**
Crosetto S.*, de Montserrat A. & Oncken O. : Marine terraces response to subduction earthquake dynamics: a forward modelling approach

13-3 **16.00 - 16.15**
Ascione A.*, Cerrone C., Di Donato V., Valente E., Di Maio G., Soligo M. & Tuccimei P. : Late Quaternary morphotectonic evolution of the Sele River Plain peri-Tyrrhenian graben (southern Italy): new data and constraints from U-series analyses

13-4 **16.15 - 16.30**
Reitano R.*, Faccenna C., Funiciello F., Corbi F., Lanari R. & Clementucci R. : Erosional laws in analogue models

13-5 **16.30 - 16.45**
Lanari R.*, Reitano R., Faccenna C., Piana Agostinetti N. & Ballato P. : Surface response to deep subduction dynamics: insight from the Apennines, Italy

13-6 **16.45 - 17.00**
Sorrentino A.*, Mondillo N. & Valente E. : Long-term relief evolution of the Andean chain in the Bongará region (northern Peru): implications for the genesis of supergene ore deposits

13-7 **17.00 - 17.15**
Cocco F.*, Casini L. & Funedda A. : The lithospheric structure of the Corsica-Sardinia Massif: a hint for geomorphic features, neotectonics and current geodynamics of the Western Mediterranean

13-8 **17.15 - 17.30**
Muller V.A.P.*, Sue C., Valla P., Sternai P., Simon-Labric T., Martinod J., Ghiglione M., Baumgartner L., Herman F., Reiners P., Gautheron C., Grujic D., Shuster D., Braun J. & Bernett M. : Exhumation response to climate and tectonic forcing in the southern Patagonian Andes (Torres del Paine and Fitz Roy plutonic complexes)

S.14 Ore deposits for a green future

The current claim for a “Clean Planet for all” requires a necessary transition to a green economy, implying an essential switch from the use of energies based on fossil fuels towards renewable energies and e-mobility solutions. This will result in a progressive increase of the global demand for raw materials. Furthermore, the widespread use of high-tech devices and the breakthroughs made in the development of new technologies, will further load on the medium-long term outlook for resource demand-supply. Considering that with current technologies, recycling alone could not meet the materials demand, the secure supply of mineral resources from ore deposits will play a pivotal role. In this session, we are glad to invite multidisciplinary contributions in the field of Economic Geology and Mineral Deposits dealing with new developments in mineral exploration, ore characterization, geology and metallogenesis

of base, precious, and critical metals deposits, from greenfield or ancient mine sites in Italy, Europe and worldwide. We also encourage contributions dealing with innovative procedures for mineral processing and re-use of mine wastes and tailings.

Presentazioni orali

4-1 **11.00 - 11.30**
[KEYNOTE] Herrington R.J.* : Mining a green future

14-2 **11.30 - 11.45**
Fumanti F.*, Dacquino C., Siclari M., Verdura M.G., Vigna G., Negri M. & Mining W.G. : Reassessment and sustainable management of national mineral resources, essential raw materials to achieve ecological and digital transition

14-3 **11.45 - 12.00**
Dini A., Lattanzi P.*, Ruggieri G. & Trumpy E. : Lithium resources of Italy: an overview

14-4 **12.00 - 12.15**
Zanin S.* : Altamin, Italian base and battery metals exploration and production

14-5 **12.15 - 12.30**
Domenighini G.*, Santoro L., Moroni M. & Zanin S. : Co-Ni mineralization in the Punta Corna hydrothermal vein system (Piemonte, Italy): preliminary results

14-6 **12.30 - 12.45**
Chirico R.*, Mondillo N., Laukamp C. & Zanin S. : Hyperspectral remote and proximal sensing for mineral exploration: the Punta Corna Co-Ni vein system (Piedmont, Italy)

14-7 **12.45 - 13.00**
Grieco G.*, Naitza S., Cocomazzi G., Deidda M.L., Bussolesi M., Cazzaniga A. & Zanetta G. : Recycling feldspar wastes as buffer for AMD remediation: preliminary tests on sulfide-rich materials from Sardinia abandoned mines

14-8 **15.30 - 16.00**
[KEYNOTE] Pirajno F.* & Yu H.-C. : Carbonatites and associated REE mineralisation

14-9 **16.00 - 16.15**
Villanova-de-Benavent C.*, Proenza J.A., Torró L., Aiglsperger T., Domènech C., Domínguez-Carretero D., Ramírez A. & Rodríguez J. : REE-bearing mineralogy in the karst bauxites of the Pedernales peninsula, Dominican Republic

14-10 **16.15 - 16.30**
Carrillo-Marrodan L.G.* & Castro-Mora J. : The Neoproterozoic high grade metamorphic complex as potencial REE hosted rocks in Oaxaca, southern Mexico

14-11 **16.30 - 16.45**
Boni M.* : Vanadium in circular economy and vanadium deposits in the African continent

14-12 **16.45 - 17.00**
Bouabdellah M., Boukirou W., Caracausi A.*, Italiano L. & Zemri O. : Noble gases as powerful geochemical tools to investigate ore deposits: a case study of Mississippi Valley Type deposits, Jbel Bou Dahar Pb-Zn district, Eastern High Atlas, Morocco

14-13 **17.00 - 17.15**
Giorno M.*, Barale L., Bertok C., Burisch M., Frenzel M., Looser N., Bernasconi S.M. & Martire L. : New insight into ore formation at the Gorno MVT district (Northern Italy)

14-14 **17.15 - 17.30**
Summino L.*, Bertok C., Martire L. & Piana F. : Structural and stratigraphical characterization of the Vedra Valley sulphides deposit (Oltre il Colle, BG, Italy)

14-15 **17.30 - 18.00**
[KEYNOTE] Fiorentini M.* : Dynamics of metal and volatile flux across the lithosphere

14-16 **18.00 - 18.15**
Cherdantseva M.* & Fiorentini M. : Isotopic and trace element signatures of calcite, apatite and zircon from carbonatite liquid associated with Cu-Ni-PGE mineralization

14-17 **18.15 - 18.30**
Bongiovanni M.*, Fusswinkel T., Marks M. & Kocher S. : Chlorine-bromine-iodine systematics as tracer of fluid and metal sources in Sn-W mineralized magmatic-hydrothermal systems

14-20 **18.30 - 18.45**
Vezzoni S.*, Pieruccioni D., Molli G., Biagioni C. & Dini A. : Origin and metamorphic reworking of the Buca della Vena Tl-rich orebody (Alpi Apuane)

14-19 **18.45 - 19.00**
Idini A.*, Colonna T., Carmignani L. & Conti P. : Coltan-bearing LCT pegmatites from Nuflo de Chavez Province, Eastern Bolivia

14-18 **19.00 - 19.15**
Deidda M.L.*, De Giudici G.B., Fancello D., Idini A., Tavazzani L. & Kouzmanov K. : Towards the definition of a Sn-W-Mo late Variscan skarn-system in Southwestern Sardinia: evidence from key-areas in the Sulcis-Iglesiente district

14-21 **19.15 - 19.30**
Sorrentino A.*, Chirico R., Corrado F., Laukamp C. & Mondillo N. : District-scale mapping of hydrothermal and supergene alteration zones from PRISMA satellite hyperspectral data in the Coastal Cordillera of northern Chile

S.15 Mineralogy and waste: circular economy for a sustainable future

The production of waste, both toxic and non-toxic, is greatly increased in recent years due to population growth, booming economy, and rapid urbanization. Construction and demolition waste (CDW), asbestos-containing material (ACM), water treatment sludge (WTS), municipal incinerator ash (MIA), are only a few of the long list of inorganic wastes produced. The increasing amount of waste produced, along with the need to find alternative to raw materials conventionally employed for the production of goods, is of great concern to nations, municipalities, and individuals. Landfilling does not represent a sustainable solution, not least because of the difficulties to find virgin lands in highly populated countries such as Italy. A smarter solution would be waste detoxification (if required) and recycling into secondary raw material (SRM). If adopted, this would (i) reduce the waste volume (limiting land reclamation), (ii) produce a valuable SRM (thus preserving resources), and (iii) eliminate any health and environmental hazard. In this respect, mineralogy can give a decisive contribution from many points of view. The session is therefore open to contributions about waste (toxic, non-toxic) treatment and recycling in a perspective of circular economy. These include (but are not limited to): (i) use of secondary raw materials in industrial and non-industrial processes, (ii) reuse and recycling of waste, (iii) inertization of hazardous materials for redeployment, (iv) recovery of critical raw materials from secondary sources, (v) removal and recovery of gases, heavy metals and organic pollutants from natural and anthropic matrices.

Presentazioni orali

15-1 **08.30 - 09.00**
[KEYNOTE] Tribaudino M.* : Earth materials and waste: similarities and differences

15-2 **09.00 - 09.15**
[KEYNOTE] Tarantino S.C.* : From waste to secondary raw materials: new paths to enable a sustainable use of resources

15-3 **09.15 - 09.30**
Volpintesta F.*, Ossoli E., Reggiani A., Stabile P., Santulli C. & Paris E. : Potential up-cycling application of Construction and Demolition Waste from the 2016 Central Italy earthquakes

15-4 **09.30 - 09.45**
Radica F.*, Iezzi G., Trotta O., Bonifazi G. & Serranti S. : Discriminating the petrography of CDW *via* rapid spectroscopic tool

15-5 **09.45 - 10.00**
Marian N.M.*, Perotti M., Indelicato C., Magrini C., Giorgetti G., Capitani G.C. & Viti C. : Circular economy approach in the management of large volume inorganic wastes: the case of red gypsum from the TiO_2 industry

15-6 **10.00 - 10.15**
Arletti R.*, Conte S. , Zanelli C. , De Iuliis M., Di Giuseppe D., Scognamiglio V., Malferrari D., Dondi M. & Gualtieri A.F. : Secondary raw materials for innovative and sustainable ceramic production: recycling the product of thermal inertization of vitreous fibers

15-7 **10.15 - 10.30**
Taddei A.*, Lepore G.O., Bindi L. & Bonazzi P. : Structural and ion-exchange properties of hydropyrochlore: Towards a potential waste form to immobilize thallium in polluted environments

S.16 The challenge of alkali-activated materials: new chance for a sustainable world

The environmental sustainability is one of the main global tasks addressed by the scientific-technical community. In this scenario the research of green materials to contrast the energy consumes and environmental pollutions caused by the traditional materials, such as the massive production of Portland cement, increases exponentially in the last decades. The new green frontier in materials field is represented by alkaline cement or geopolymeric cement- as

they are called- thanks to their final properties and low environmental impact, limiting as possible the CO2 emissions in the atmosphere. Indeed, they do not need high temperature calcination, and most of them can be synthesized at room temperature with high energy and money save. Alkaline activated materials (AAM) are inorganic materials produced by the alkaline activation of several aluminosilicate sources, deriving by natural or waste materials, whose final 3D dimensional network structure is mainly amorphous. In addition to the low environmental impact, they are very appreciated for wide versatility in different field applications both in building sector and industrial one. The aim of the session is to consider the key results of each research in the design and implementation of solutions based on alkali activated materials, trying to assess the way on how to exploit their properties in each context..

Presentazioni orali

16-1 **11.00 - 11.30**
[KEYNOTE] Lancellotti I., Dal Poggetto G., Kamseu E., Andreola F., Barbieri L., Romagnoli M. & Leonelli C.* : Alkali activated materials: the experience in Modena

16-2 **11.30 - 11.45**
Lancellotti I.*, Altimari F., Barbieri L. & Maggi B. : Volcanic scraps as mineral resources for the design of sustainable alkali activates materials

16-3 **11.45 - 12.00**
Clausi M.* & Pinto D. : Design and characterization of alkali-activated binders from water potabilization sludges

16-4 **12.00 - 12.15**
Ossoli E.*, Volpintesta F., Stabile P., Santulli C. & Paris E. : Upcycling of stone composite waste into geopolymer-based mortars for applications in the building sector

16-5 **12.15 - 12.30**
Stroscio A.* & Mazzoleni P. : Production of geopolymer binders using Sicilian clay sediments

16-6 **12.30 - 12.45**
Belhamdi H.*, Visco A., Salomone R. & Plutino M.R. : Economic and environmental impact assessments of Advanced Geopolymeric materials

16-7 **12.45 - 13.00**
(Invited) Gatta G.D.*, Battiston T. & Comboni D. : Sorel cement: properties and utilization

S.17 Microporous and layered minerals: properties and applications for a sustainable future

The crystal-chemistry and structural features of microporous and layered minerals generate unique physical-chemical properties, largely exploited in many fields: from industrial processes to agriculture, environmental protection and many others. Among their peculiar properties, cation-exchange capacity, molecular adsorption by crystal-fluid interaction and catalytic ability will continue to become more and more valuable in the upcoming future, when sustainability, with its many possible declinations in terms of e.g. environment, economy or efficiency, will acquire an ever-growing relevance. In this session, contributions on crystal-chemistry, properties, and applications of microporous and layered minerals (or their synthetic counterparts) in environmental and other fields, are welcome. Experimental and theoretical studies are expected to provide a common ground of discussion for geo-scientists performing researches on these fascinating materials.

7-1 **17.30 - 17.45**

Lepore G.O.*, Schingaro E., Mesto E., Lacalamita M., Cristiani C., Gallo Stampino P., Dotelli G., Finocchio E., d'Acapito F. & Giuli G. : The role of layered silicates in REE recovery: La uptake and release processes in natural and modified montmorillonites

17-2 **17.45 - 18.00**

Vola G.*, Massa M., Ardit M., Bresciani P., Sarandrea L. & Cruciani G. : Process optimization and characterization of dolomitic hydrated limes with high BET specific surface area for “green applications”

17-3 **18.00 - 18.15**

Belviso C.*, Orlando S., Lettino A., Medici L., Mollica D. & Guarnaccio A. : Synthetic zeolite as targets of fs pulsed laser ablation: effects

17-8 **18.15 - 18.30**

Mancinelli M.*, Ahrens L., Bonnet B. & Martucci A. : Adsorption of PFAS to different zeolites: characterization using LC/MS-MS, X-ray diffraction and thermal analysis for industrial application and real environmental conditions

17-5 **18.30 - 18.45**

Montesano G.*, Cappelletti P., Caputo D., Liguori B., Campanile A. & Rispoli C. : Mineralogical and technological characterization of zeolites from Basin and Range as pozzolanic addition of cement

17-6 **18.45 - 19.00**

Battiston T.*, Comboni D., Pagliaro F., Lotti P. & Gatta G.D. : *P*-induced crystal fluid interaction: the case of ERI and OFF topology

17-7 **19.00 - 19.15**
Fantini R.*, Vezzalini G., Confalonieri G., Di Renzo F., Mino L., Cavalli R., Argenziano M., Fischer M. & Arletti R. : Microporous Minerals Catching Sun: UV filters encapsulation in Zeolites

17-4 **19.15 - 19.30**
Izzo F.*, Mercurio M., Germinario C., Grifa C. & Langella A. : Comparing technological performance of natural zeolite-rich composites for the sorption of non-steroidal anti-inflammatory drugs

S.18 Celebrating the International Year of Mineralogy: two centuries of progress and discoveries

More than two centuries of mineralogical and crystallographic studies, following the seminal works of René Just Haüy, greatly improved our insight on the extraordinary complexity hidden in minerals. Structural analyses helped to elucidate the role played by minor components, contributing to the understanding of the conditions of formation of minerals and allowing the description of unpredictable structures critical for assessing their technological potentialities. This session aims at discussing recent advances on structural properties, chemistry, classification and nomenclature of minerals. Contributions regarding the description of new minerals, re-examination of the crystal-chemical features of known mineral species, nomenclature and classification issues, as well as studies on the relationship between compositional and structural features of minerals, will be welcome.

Presentazioni orali

18-1 **17.30 - 18.00**
[KEYNOTE] Ferraris G.* : Crystal structure of minerals: from Haüy's hypothesis to Braggs' experimental evidence

18-2 **18.00 - 18.15**
Pereti C., Bernot K., Bindi L.*, Fanelli D., Guizouarn T., Laufek A., Sessoli R. & Vymazalova A. : When mineral sciences meet artificial intelligence: an outstanding example about how Mineralogy can continue to surprise us and have a strong impact on other disciplines

18-3 **18.15 - 18.30**
Pasero M.* & Chukanov N.V. : Systematics of *M*:O = 1:2 oxide minerals, and adjustments needed in some of their chemical formulae

18-4 **18.30 - 18.45**
Biagioni C.* & Sejkora J. : Tetrahedrite-group minerals: a new life for one of the oldest sulfosalt groups

18-5 **18.45 - 19.00**
Comboni D.*, Battiston T., Pagliaro F., Lotti P., Hanfland M. & Gatta G.D. : Phase stability of hydrated borates at high pressure

18-6 **19.00 - 19.15**
Della Ventura G.*, Redhammer G.J., Ventruti G., Oberti R., Radica F., Bernardini S. & Mihailova B. : The thermal stability of riebeckite under different oxidation conditions

18-7 **19.15 - 19.30**
Conconi R.*, Fumagalli P., Lucotti A. & Capitani G. : A multi-methodological study of syntactic intergrowths and polysomatism in Ca-REE fluorcarbonate minerals from Mount Malosa (Malawi)

S.19 Slow rock slope deformations in different geodynamic and climatic settings: processes, activity, hazards.

Deep-seated gravitational slope deformations (DSGSD) are giant landslides with long lifespan (10^3-10^5 yr) that involve entire high-relief slopes. DSGSDs are often active at slow rates (up to cm/yr), threatening critical infrastructures, and host large landslides possibly undergoing progressive failure until collapse, making these phenomena important landscape evolution and geohazard players. Geological, geomorphological and geotechnical studies at both the regional and slope scale demonstrated that these phenomena are widespread in contrasting geodynamic and climatic settings. Indeed, large slope deformations evolve under different controls and mechanisms in different settings, characterized by diverse rock types, tectonic activity and geomorphic impacts of glaciations, resulting in tectonics/fluvial dominated (e.g. Apennines) vs (para)glacial landscapes (e.g. Alps). Nevertheless, the impacts of these controls and mechanisms on the regional distribution and geohazard potential of DSGSD are not completely understood. We invite innovative and interdisciplinary contributions bridging geomorphology, structural and engineering geology, using different approaches (inventory studies, fieldwork, geochronology, monitoring/remote sensing, numerical modeling) to improve our understanding of slow rock slope deformations in

contrasting geological settings (including Alps and Apennines) with reference to: a) controls on spatial distribution, mechanisms and long-term evolution; b) styles of present-day activity; c) mechanisms of transformation into fast, potentially catastrophic large landslides.

Presentazioni orali

9-1 **11.00 - 11.15**

[KEYNOTE] Manconi A.* : From slow to fast surface displacements in complex scenarios: spatial and temporal evolution of the Brienz/Brinzauls deep-seated landslide, Switzerland

19-2 **11.15 - 11.30**

Cignetti M.*, Godone D., Notti D., Giordan D., Calò F., Reale D., Verde S. & Fornaro G. : Classification of the state of activity of Deep-seated Gravitational Slope Deformation phenomena of the Aosta Valley Region exploiting Sentinel-1 data processed by SAR tomography

19-3 **11.30 - 11.45**

Annibali Corona M.*, Guerriero L., Di Martire D., Ammirati L. & Calcaterra D. : From PS-driven identification to numerical modelling: DSGSDs of Mount Bulgheria in Southern Italy

19-4 **11.45 - 12.00**

Donati D.*, Stead D., Rabus B., Engelbrecht J., Clague J.J., Francioni M. & Borgatti L. : Application of multi-sensor, multi-temporal, multi-scale remote sensing datasets for landslide analysis

19-5 **12.00 - 12.15**

Ferrario M.F.*, Livio F., Zerboni A., Mariani G.S., Martinelli E. & Amit R. : Deep-seated gravitational slope deformation in the Cavargna Valley (Central Southern Alps): triggering processes and slope evolution

19-6 **12.15 - 12.30**

Crippa C.*, Agliardi F., Schibuola R. & Chen R.F. : Slow rock slope deformations in rapid tectonic uplift areas: the cases of Yienchi and Yakou (Taiwan)

19-7 **12.30 - 12.45**

Del Rio L.*, Moro M., Fondriest M., Saroli M., Masoch S., Doumaz F., Gori S., Falcucci E., Cavallo A., Lutterotti L., Artioli G., Borovin E. & Di Toro G. : Slip surfaces associated with seismic faults and gravitational slope deformations in carbonate rocks

19-8 **12.45 - 13.00**
Delchiaro M.*, Marmoni G.M., Della Seta M. & Martino S. : Time-dependent rock-mass deformations, geological aging and landscape evolution as predisposing factors for large rockslide triggering

S.20 Landslides from mountain to coastal environments and beyond

Landslides are an important landscape-shaping process, being one of the main mechanisms for sediment release and transport. They affect all sorts of terrains, from mountainous to coastal, from desertic to sub-aqueous, at all latitudes in various geological, tectonic, and climatic settings, including both undisturbed and anthropogenically modified landscapes. They have even been recognised on other planetary bodies (e.g., Mars, Moon). The triggering, geological and geomorphological characteristics, dynamics and development of landslides represent a central theme in geomorphology. The rates at which landslide processes act to modify the landscape are extremely varied, and span a wide range of spatial and temporal scales. This session combines contributions investigating recent or past landslide events on all terrestrial and extra-terrestrial environments. In particular, we welcome studies that apply a diverse set of tools and data analyses, including field and ground-truthing characterization, mapping, remotely sensed/GIS-based analyses, inventories, geochemical and fingerprinting measurements and techniques, dendrochronological approaches, cosmogenic radionuclide dating, and experimental/numerical modelling.

20-1 **17.30 - 18.00**
[KEYNOTE] Magnarini G.* : The geomorphological record of long runout landslides in the Solar System

20-2 **18.00 - 18.15**
Scorpio V.*, Steger S., Comiti F. & Cavalli M. : Geomorphic impacts of connected debris flows on river corridor during an extreme storm: a case study in the Italian Alps

20-3 **18.15 - 18.30**
Sepe C., Calcaterra D., Di Martire D., Fusco F., Tufano R.*, Vitale E. & Guerriero L. : Triggering conditions and propagation of the 2019 Palma Campania landslide: implication for residual hazard estimation

20-4 **18.30 - 18.45**
Pittau S.*, Rossi M. & Brardinoni F. : Evaluation of historical landslide activity (1954-2018) in relation to land-cover changes in the Sillaro River basin, Northern Apennines

20-5 **18.45 - 19.00**
Guerini M.*, Giardino M., Paranunzio R., Nigrelli G., Turconi L., Luino F. & Chiarle M. : Conditioning factors of high mountain landslides: geological constrains and influences of permafrost degradation in the Italian Alps over the last two decades

20-6 **19.00 - 19.15**
Fullin N.*, Duo E., Fabbri S., Ghirotti M. & Ciavola P. : Coastal cliff retreat and landslide processes: a preliminary quantitative characterization at Portonovo-Trave cliffs (Conero, Ancona, Italy)

20-7 **19.15 - 19.30**
Campilongo G.*, Ponte M., Catanzariti F., Muto F. & Critelli S. : Modelling of slopes in the Calabrian coastal area using FEM and LEM method

S.21 Monitoring and sustainable management of natural and artificial cavities: a contribution toward mitigation of the risk from underground processes

Hypogean environments are among the most important geological features in the world, hosting natural, historical, cultural heritage and important economic resources. Natural and artificial cavities have exceptional aesthetical and scientific values, especially for their richness in spelothems, secondary minerals, biodiversity, and the extraordinary Quaternary archive they represent. Developing tourism in show caves could expose them to a series of degradation processes such as CO2 and temperature increase, speleothem corrosion, lampenflora growth, and pollution. On the contraries, artificial cavities such as mines and quarries, could contribute to pollution of nearby environments, including groundwater, and be at the origin of sinkholes, with catastrophic consequences for the built-up environment. A proper management of the underground is therefore essential for conservation of these ecosystems and their resources. In this scientific session, geomatics techniques useful for detecting subterranean environments, monitoring, analysis of pollutants, and studies on speleothems, minothems and their weathering will be discussed, in order to monitor the current status of the cavities and to find solutions for their conservation and management. Further, the need of deeper knowledge of artificial cavities, aimed at mitigating the risk related to their collapse, will also be dealt with.

Presentazioni orali

21-1 **15.30 - 15.45**
Faccini F.*, Bixio R., Ferrando A., Montanari G., Piana P., Saj S., Terrone M. & Traverso M. : Survey and inventory of artificial cavities in the historical centre of Genoa (Italy): a contribution to the development of an experimental Underground Master Plan

21-2 **15.45 - 16.00**
Ruberti D.*, Fabozzi M.A. & Vigliotti M. : The hidden world of artificial cavities in the northern Campania Plain: architectural variability and cataloging challenge

21-3 **16.00 - 16.15**
Parise M.*, Castellanza R. & Lollino P. : A project addressed toward mitigation of the sinkhole risk

21-4 **16.15 - 16.30**
Cozzolino M., Gentile V. & Mancini M.* : Joint use of historiographic, toponymic, topographical, speleological and geophysical data for the identification of the presumed entrance of the alabaster cave/quarry of Fontegreca (Caserta, Italy)

21-5 **16.30 - 16.45**
Garello A., Caselle C.*, Bonetto S. & Masciocco L. : Geo-environmental characterization of a gypsum underground quarry site for sustainable remediation strategies

21-6 **16.45 - 17.00**
Vigna B. & Fiorucci A.* : Risk of sinkholes in underground mining activities: the importance of monitoring data

21-7 **17.00 - 17.15**
Cardia S.*, Palma B. & Parise M. : New stability evaluation methods based on discontinuity sets recognition from 3D point clouds aimed at the protection of underground sites

21-8 **17.15 - 17.30**
Zaragoza A.*, Teloni R. & Zambrano M. : Characterisation of shallow cavities and geological heterogeneities in urban environments: case study from the medieval village of Camporotondo di Fiastrone (MC)

21-9 **17.30 - 17.45**
Addesso R.*, De Waele J. & Baldantoni D. : Sediment and water geochemistry shedding light on ecohydrology and anthropogenic impacts in Pertosa-Auletta Cave

21-10 **17.45 - 18.00**
Di Cicco M.*, Fiasca B., Galassi D.M.P., Liso I.S., Parise M. & Vaccarelli I. : Potential factors driving the distribution of subterranean invertebrates in karst groundwaters of the Rotolo Cave (southern Italy)

21-11 **18.00 - 18.15**
Balestra V.* & Bellopede R. : Microplastic pollution in show cave sediments

21-12 **18.15 - 18.30**
Menichetti M.* : The impact of visitors on the microclimate of Italian touristic show caves

21-13 **18.30 - 18.45**
Vigna B.*, De Regibus C. & Balestra V. : Environmental parameters monitoring in show caves: some examples from NW Italian show caves

21-14 **18.45 - 19.00**
Cossu Q.A., Cinus D.*, Isaia M., Piano E. & Duce P. : Environmental monitoring of Su Marmuri cave (Ulassai), a preliminary picture

21-15 **19.00 - 19.15**
Piano E.*, Nicolosi G. & Isaia M. : Towards a sustainable touristic use of show caves: suggestions to control *lampenflora* proliferation

21-16 **19.15 - 19.30**
Pellegrini M.*, Beatrice F., Djebaili R., Vaccarelli I., Ercole C., Spera D.M., D'Alessandro A.M. & Del Gallo M. : Microbial lampenflora composition: the case study of the "Stiffe" show cave

S.22 Naturally Occurring Asbestos (NOA): hazard identification, assessment and mitigation Over the last decades, many researchers focused on asbestos and other mineral fibres with the aim to assess their potential hazard for human health. Currently, health problems related to exposure to naturally occurring asbestos (NOA) shifted the attention of the scientific community from the occupational/industrial area to the geo-environmental domain. NOA is a common constituent of various types of rocks and soil in different geological settings worldwide. Disturbance of NOA-bearing rocks and soils, especially through human activities, can result in airborne asbestos fibres, leading to potential inhalation and health risk. This session aims to explore the characterization, occurrence, environmental dispersion, and toxicology of NOA and elongate mineral particles (EMP). Contributions on mineralogy, geology, environmental chemistry, epidemiology and medicine are welcome. The main goal is to provide new data and new research perspectives to the scientific audience that is increasingly called upon to support local/national environmental and health agencies in the identification and quantification of NOA/EMP risk, and in the development of management plans to minimise the risk of exposure to the population.

Presentazioni orali

22-1 **08.30 - 09.00**
[KEYNOTE] Gaggero L.*, Sanguineti E., Yus Gonzales A., Militello G., Annis S. & La Maestra S. : Management and mitigation of asbestos related risk derived from natural occurrences and anthropogenic dispersion

22-2 **09.00 - 09.15**
Pereira D.*, López A.J., Ramil A. & Bloise A. : Laboral safety. How Science can increase perception of asbestos-related disease risk

22-3 **09.15 - 09.30**
Rabiee A., Della Ventura G.*, Mirzapour F., Paglietti F., Malinconico S. & Bellagamba S. : Design of a compact device for airborne asbestos measurement: challenges and solutions

22-4 **09.30 - 09.45**
Gianoncelli A.*, Rizzardi C. & Pascolo L. : Synchrotron techniques for the study of asbestos interactions with lungs

22-5 **09.45 - 10.00**
Raneri S.*, Fornasini L., Gianoncelli A., Villalobos E., Di Giuseppe D., Scognamiglio V., Mirata S., Almonti V., Bonanni V., Parisse P., Bersani D., Bassi A.M., Marengo B., Scarfì S. & Gualtieri A.F. : Release of metals and dissolution of mineral fibres in THP1 macrophagic cell-line systems exposed to chrysotile asbestos. A synchrotron-based study

22-6 **10.00 - 10.15**
Mirata S.*, Di Giuseppe D., Almonti V., Vernazza S., Gualtieri A.F., Bassi A.M., Scarfì S., Fornasini L., Raneri S. & Bersani D. : The acute toxicity of mineral fibres: a systematic *in vitro* study using different THP-1 macrophage phenotypes

22-7 **10.15 - 10.30**
Giordani M.*, Meli M.A., Roselli C., Betti M., Peruzzi F., Taussi M., Valentini L., Fagiolino I. & Mattioli M. : Natural ^{210}Po-rich fibrous epsomite: a human health issue?

22-8 **11.00 - 11.15**
Rimoldi B.* : Naturally Occurring Asbestos (NOA) fibers spreading: the INAIL approach

22-9 **11.15 - 11.30**
Guercio A.* : Actions to prevent Naturally Occurring Asbestos (NOA) fibers spreading: the INAIL approach

22-10 **11.30 - 11.45**
Hyskaj A.*, Schimek É., Weiszburg T. & Harman-Tóth E. : Naturally Occurring Asbestos recognition and response actions in European environmental decision making

22-11 **11.45 - 12.00**
Claire T., Misseri M. & De Salvo S.* : The problem of environmental asbestos (and EMP) in France

22-12 **12.00 - 12.15**
Barale L.*, d'Atri A., Petriglieri J.R., Piana F. & Turci F. : Naturally occurring asbestos (NOA) in sedimentary rocks: a case study from the Tertiary Piemonte Basin

22-13 **12.15 - 12.30**
Avataneo C.*, Capella S., Lasagna M., De Luca D.A. & Belluso E. : Extensive characterization of mineral fibres dispersed in the water system from a naturally occurring asbestos (NOA)-rich area

22-14 **12.30 - 12.45**
Bruno M.R.*, Sinopoli F., Cannizzaro A., Olori A., Angelosanto F. & Campopiano A. : Asbestos fibers in drinking water in Monte Reventino area (Central Calabria)

22-15 **12.45 - 13.00**
Gualtieri A.F.* : Globalization and asbestos. The issue of the flow of asbestos-contaminated raw materials in the free world market

S.23 Geology is coming home. A renewed interest in Italian geoscientific tradition

Geology has been an Italian science. In his “Principles of Geology” (proem to 1st edition, 1830) Sir Charles Lyell paid homage to the forerunners of Earth sciences in our Country. Italian primacy in the early stages of development of geological disciplines, between 16th and 18th century, was in fact strongly admired by the founder of modern geology. The birth of the term “Giologia”, coined by to Ulisse Aldrovandi in Bologna in 1603, has been celebrated on the occasion of its 400th anniversary. This recurrence initiated a renewal of interest in Italian geoscientific tradition, on the grounds of pioneer studies of Bruno Accordi and Nicoletta Morello, from the geological and epistemological points of view respectively. The session is aimed to promote interdisciplinary contributions on Italian Earth sciences and to stimulate the interaction between the scientific and historical approach. Promoting public awareness and understanding the importance of Earth sciences is in fact a crucial issue for Italy, a Country constantly facing the consequences of natural hazards. Celebrating ten years of intense activity of the History of geosciences Section, established in 2012 by the Italian Geological Society, we would thus venture to say that “Geology is coming home!”.

Presentazioni orali

23-1 **17.30 - 17.45**
[KEYNOTE] Dal Piaz G.V.* : Felice Giordano a great geoitalian

23-2 **17.45 - 18.00**
Sella M.* : Quintino Sella mining engineer in Sardinia

23-3 **18.00 - 18.15**
Borghi A.*, Giacobino E., Senesi M. & Gallo M. : The historical collections preserved at the Regional Museum of Natural Sciences: a multimedia recovery and enhancement action

23-4 **18.15 - 18.30**
Roghi G.* : Upper Valsugana: a laboratory for nineteenth-century geological studies

23-5 **18.30 - 18.45**
Lupi C.*, Console F. & Severino F. : Torquato Taramelli: the art of Science

23-6 **18.45 - 19.00**
Macini P.* : Giovanni Capellini's Journey to Wallachia (1864): Travel Notes and Early Insights into Petroleum Geology

23-7 **19.00 - 19.15**
Mazzini I.*, Talenti E., Innocenti G. & Cianfanelli S. : Marianna Paulucci: the "first lady" geologist of the Italian Geological Society

23-8 **19.15 - 19.30**
Lippolis E.*, La Perna R. & Tropeano M. : Arcangelo Scacchi, an Apulian geoscientist in the 19th century

S.24 Geosciences and museums: integrated approaches for a sustainable future

Geo-paleontological, petrographic and mineralogical museums, with their heritage of unique historical and scientific importance, have a high research and educational value. They act as a dissemination tool for the knowledge of the Earth sciences, their evolution over time and their role for the development of a present and future consciousness. However, are modern museums doing enough in order to involve the society in the construction of a sustainable future? Are they evolving and adopting more sustainable practices for conservation, high-quality research,

collections updating and dissemination purposes? This session is open to contributions about: i) new methodological approaches to disseminate research and raise awareness of the society on sustainability; ii) sustainable and innovative research based on the museum specimens; iii) and new and smart practices for the conservation and valorization of mineralogical, petrographic, paleontological and other Earth sciences collections. Didactic methodologies based on museums' activities, as well as experiences, good practices and ideas for a more efficient cataloguing and digitalization of the geoscience collections are also warmly encouraged. The session will be a crucial opportunity for promoting discussion and collaborations.

Presentazioni orali

24-1 **11.00 - 11.30**
[KEYNOTE] Macrì M.* & Sardella R. : MUST 2.0

24-2 **11.30 - 11.45**
Lupi C.*, Guaschi P. & Guioli S. : *Terra Nascosta*: an experiential exhibition to discovery Taramelli and the modern Geology

24-3 **11.45 - 12.00**
Azevedo M.* : The resumption of the collection as a protagonist: the Geosciences Museum of IGc-USP

24-4 **12.00 - 12.15**
Giudetti G.*, Simoni G., Lenzi A., Taccone R., Vecchieschi G. & Clementi R. : The Larderello Geothermal Museum: history of a renewable energy invention

24-5 **12.15 - 12.30**
Curcuruto E.* : The sulphur crystals collection of Mining School "S.Mottura" in Caltanissetta: 160 years of sulphur mining history

24-6 **12.30 - 12.45**
Paschetto A.*, Bonetto S., Gilli M. & Altomare P. : Enhancement of mining heritage of Piemonte, proposals for a didactics and touristic network

24-7 **12.45 - 13.00**
D'Arpa C.*, Di Patti C. & Di Stefano P. : The Museo Gemmellaro: a dynamic tool for increasing research and dissemination

24-8 **15.30 - 15.45**
Mazzoleni P.* & Cirrincione R. : The museum of Mineralogy, Petrography and Volcanology of the University of Catania: a multitasking museum

24-9 **15.45 - 16.00**
Caggiani M.C.*, Coccato A., Cavarra M., Manenti A.M. & Barone G. : In situ Raman analyses of gems and decorative stones of museum collections

24-10 **16.00 - 16.15**
Fabrizi L.*, Moggi Cecchi V., Bronconi C., Fantoni L. & Benvenuti M. : Unveiling the Medicean Collection of "Carved Stones"

24-11 **16.15 - 16.30**
Martiniello S.*, Sciuto C., Capitanio A., Lorenzetti G., Legnaioli S., Sala F., Torriti P. & Raneri S. : Synopsis of a treasure. A transdisciplinary study of medieval goldworking's biographies

24-12 **16.30 - 16.45**
Fabrizi L., Leone I., Graziani V. & Ruggiero L.* : A dip in the Cretaceous reef… of Rocca di Cave

24-13 **16.45 - 17.00**
Thun Hohenstein U.*, Muttillo B., Zunino M., Pavia M., Isaia M., Delpiano D., Parisi C., Arnetta G., Vaccaro C. & De Curtis O. : Digital enhancement of the paleontological heritage of the Valdemino show cave (Borgio Verezzi, Savona, Italy)

24-14 **17.00 - 17.15**
Bartolini-Lucenti S., Cioppi E., Bellucci L. & Rook L.* : Digitisation of the palaeontological collection of the Museum of Geology and Palaeontology of the University of Florence

24-15 **17.15 - 17.30**
Bellucci L.*, Bartolozzi L., Biaggini M., Cecchi L., Innocenti G., Manca R., Mancinelli M.L., Moggi Cecchi V., Porena M., Presutti V., Rossi P.F., Rossi De Gasperis S., Veninata C. & Benvenuti M. : DiSSCo Prepare: towards an European Infrastructure for Scientific Collections

S.25 Geosciences at School

The session is an opportunity for discussion among school and university teachers in order to improve the geoscience skills of the next generation of citizens. New approaches and methods for education in Geosciences will be presented and discussed, including ICT practices in place for secondary and higher education, with particular emphasis on innovative experiences of distance education. Contributions related to learning sequences and activities in Earth science topics, international experiences, research in geoscience education, and collaborative education experiences between schools and universities, natural history museums, science centers, are welcome. The session will also be an opportunity to present and discuss experiences and results of the national geoscience program PLS (Scientific Degrees Project), as well as best practices in teacher education in Earth Sciences. Teachers of all school

grades and researchers are invited to participate and contribute with their projects and activities, with the aim of spreading the culture of Earth Sciences in schools and society.

Presentazioni orali

25-1 **08.30 - 08.45**
Berra F.* : Teaching geology, from books to Earth: the contribution of geological maps, a powerful but neglected educational tool

25-2 **08.45 - 09.00**
Borghini A.*, Pieraccioni F., Bastiani L., Bonaccorsi E. & Gioncada A. : Alternative ideas of the Italian students about the geoscience: a survey

25-3 **09.00 - 09.15**
Lozar F.*, Palomba M., Storta E., Borghi A., Stella I. & Franco F. : Geology and the city: how to introduce Geosciences to high school pupils

25-4 **09.15 - 09.30**
Gastaldi M.*, Beccaceci A. & Paris E. : “A Network of Schools for Sustainable Development”. The Role of Education in Mitigating Plastic Pollution

25-5 **09.30 - 09.45**
Corti V.*, Macario M., Olmastroni S., Palmeri R., Sandroni S. & Cornamusini G. : “When Antarctica was a garden” - A multimodality workshop involving science teachers

25-6 **09.45 - 10.00**
Piangiamore G.L.*, Maraffi S. & Sacerdoti F.M. : A board game meets an App… this is *GeoRisk*!

25-7 **10.00 - 10.15**
Giai M.* : Technominerals, technology under the microscope: design of lectures straddling science and social awareness in the context of secondary school classes

25-8 **10.15 - 10.30**
Occhipinti S.* : The Data Mining Test: an unexpectedly effective tool to promote and recognize soft and hard skills in Earth sciences

S.26 Climate change and the fossil record

How ecosystems will adjust to near-future climate changes is a challenging question for scientist and policymakers worldwide. An understanding of how biotas could respond to global warming is needed to plan appropriate conservation and economic strategies. To estimate the effect of the near future climate warming on marine and terrestrial ecosystems, long-term studies are essential. Nevertheless, such questions are difficult to address within laboratory conditions or through systematic field surveys, which rarely last longer than a decade. A complementary approach is to investigate biotic dynamics in the fossil record and in relation to past climate conditions. Geobiological archives, as fossil rich sedimentary successions, can lengthen records of geosystem responses to climate changes far beyond the timescale of direct ecological monitoring. In this context, we seek here studies of long-term responses of marine and terrestrial ecosystems affected by climate oscillations. In detail this session will explore how palaeoecological, geochemical and sedimentological approaches to sedimentary successions, can enhance interpretation of past sedimentary environments and past biotic trends. Indeed, understanding the structure and composition of past ecosystems and environmental changes through time allow to depict hypothetical scenarios of community and geosystem dynamics in the face of future climate changes.

Presentazioni orali

26-1 **08.30 - 09.00**
[KEYNOTE] Carnevale G.* : The Bolca Lagerstätten of northern Italy: A window into tropical marine life in early Eocene of Tethys

26-2 **09.00 - 09.15**
Rigo M.*, Onoue T., Sato H., Tomimatsu Y., Soda K., Godfrey L., Katz M., Campbell H., Tackett L., Golding M., Lei J., Husson J., Maron M., Satolli S., Zaffani M., Concheri G., Bertinelli A., Chiari M. & Tanner L. : Biotic extinction at the Norian/Rhaetian boundary (Upper Triassic): geochemical and isotope evidence of a previously unrecognised global event

26-3 **09.15 - 09.30**
Erba E.*, Faucher G., Visentin S. & Gambacorta G. : *Schizosphaerella size* and abundance variations across the Toarcian Oceanic Anoxic Event in the Sogno Core (Lombardy Basin, Southern Alps)

26-4 **09.30 - 09.45**
Galeotti S., Mannucci A.*, Reghellin D., Coxall H., Monechi S., Petrizzo M.R., Raffi I. & Skinner L. : The Low-C27r event: a turning point in carbonate cycle dynamics following the Cretaceous/Paleogene boundary disruption

26-5 **09.45 - 10.00**
Papazzoni C.A.*, Benedetti A. & Bosellini F.R. : Biodiversity patterns of Neotethys shallow-water communities (larger foraminifera and scleractinian corals) during the climate fluctuations of Paleocene and Eocene

26-6 **10.00 - 10.15**

D'Onofrio R.*, Zaky A.S., Frontalini F., Luciani V., Catanzariti R., Francescangeli F., Giorgioni M., Coccioni R., Özcan E. & Jovane L. : Paleoenvironmental changes and Biotic resilience across the Middle Eocene Climatic Optimum (MECO): Foraminiferal and Calcareous Nannofossil record from the Neo-Tethyan Baskil Section (Eastern Turkey)

26-7 **10.15 - 10.30**

Scarponi D.*, Nawrot R., Azzarone M., Pellegrini C., Gamberi F., Trincardi F. & Kowalewski M. : Ecological resilience documented in the Adriatic fossil record

26-8 **11.00 - 11.15**

Pilade F.*, Dela Pierre F., Natalicchio M., VasilievI., Birgel D., Mancini A.M., Lozar F. & Gennari R. : What happened at the end of the Messinian salinity crisis? A high resolution multiproxy approach to the Miocene-Pliocene transition in the Northern Mediterranean

26-9 **11.15 - 11.30**

Sanfilippo R.*, Reitano A., Insacco G., Rosso A. & Minniti G. : The Plio-Pleistocene section of Baia Massolivieri (Syracuse, South-Eastern Sicily): palaeclimatic and paleoenvironmental insights

26-10 **11.30 - 11.45**

Trotta S.*, Marino M., Voelker A., Rodrigues T., Flores J., Maiorano P., Girone A., Addante M. & Balestra B. : Paleoceanographic dynamics in the "41 ka world" off Southern Iberia (IODP Site U1387) based on coccolithophore assemblages

26-11 **11.45 - 12.00**

Argenio C.*, Flores J.A., Fuertes M.A., Balestra B. & Amore F.O. : Nannoplankton assemblages over the last 25 kyr: paleoproductivity and surface ocean dynamics from IODP sites U1385 and U1313

26-12 **12.00 - 12.15**

Bracchi V.A.*, Sanfilippo S., Bazzicalupo P., Bertolino M., Bruno F., Costa G., Donato G., Fallati L., Gallo A., Guido A., Leonardi R., Muzzupappa M., Negri M.P., Rosso A., Savini A., Sciuto F., Serio D., Varzi A.G., Viola A. & Basso D. : Coralligenous build-ups of the CRESCIBLUREEF project: a Mediterranean geobiological archive

26-13 **12.15 - 12.30**

Crippa G.*, Harper E.M., Leng M.J., Zanchi M. & Angiolini L. : A sclerochronological approach to test brachiopod shells as archives of seasonality

26-14 **12.30 - 12.45**

Sardella R.*, Conti J., Iannucci A., Iurino D.A., Mecozzi B., Moscarella A. & Strani F. : Changes in terrestrial ecosystems and mammalian communities during the Pleistocene of Italy

26-15 **12.45 - 13.00**

Pavia M.*, Delfino M., Govender R., Haarhoff P., Matthiews T. & Cohen B. : The Early Pliocene birds of prey from Langebaanweg, south-western Cape Province, South Africa

S.27 Earth's carbon cycle in active magmatic-tectonic systems and in the mantle: from production to transport, fixation and outgassing

So far, the global Earth's natural CO2 degassing has been considered irrelevant compared to anthropogenic emissions. However, it is becoming evident that a detailed knowledge of the deep, long-term, carbon cycle, acting at the geological time scale and involving the slow exchange of carbon between the rocks and the Earth's surface, is of paramount importance for understanding the processes that control global climate changes. We welcome all researches from across the whole field of Earth's carbon cycle that provide a contribution to our understanding of (i) the processes governing the origin, transport and cycling of carbon from the mantle to the surface through active volcanoes, (ii) the production, transfer, fixation and outgassing of carbon in different active non-volcanic systems, including both collisional and extensional settings, (iii) the stability of carbon-bearing phases at both ambient and non-ambient (high-pressure/high-temperature) conditions. These may include (but are not limited to) contributions in the fields of mantle, magmatic and metamorphic petrology, mineralogy and mineral physics, geophysics, and fluids geochemistry, based on novel and/or traditional approaches, ranging from fieldwork, to experimental petrology and mineralogy, theoretical calculations, thermodynamic modelling, fluid and melt inclusions studies, noble gas and CO2 isotopic analyses, volcanic volatiles and hydrogeological studies.

Presentazioni orali

27-1 **17.30 - 18.00**

[KEYNOTE] Frezzotti M.L.* : Carbon fluxes in the lithospheric mantle recorded by fluid inclusions

27-2 **18.00 - 18.15**

Cerantola V.*, Sahle J.S., Petitgirard S., Wu M., Checchia S., Weis C., Di Michiel M., Vaughan G., Collings I., Arató R., Wilke M., Jones A.P., Hanfland M. & Tse J. : sp^2 to sp^3 transition in amorphous carbonate glass: Implications for the storage of primordial carbon in the deep Earth

27-3 **18.15 - 18.30**
Poli S.*, Zhao S., Schmidt M.W., Rinaldi M. & Tumiati S. : An experimental determination of the liquidus and a thermodynamic melt model in the $CaCO_3$-$MgCO_3$ binary: modelling carbonated mantle melting

27-4 **18.30 - 18.45**
Innocenzi F., Ronca S., Agostini S., Pistocchi L., Foley S. & Lustrino M.* : Three occurrences of kalsilite bearing-rocks in central Italy – a first comparison

27-5 **18.45 - 19.00**
(Invited) Girault F.*, France-Lanord C., Adhikari L.B., Upreti B.N., Paudyal K.R., Gajurel A.P., Agrinier P., Losno R., Groppo C., Rolfo F., Thapa S., Tamang S. & Perrier F. : Crustal fluids in the Nepal Himalaya: spatial organization and sensitivity to the earthquake cycle

27-6 **19.00 - 19.15**
Ariano A.*, Frondini F., Cardellini C., Chiodini G., Ricci L., Vetuschi Zuccolini M. & Virgili G. : Emissions of carbon dioxide, methane and heat in the geothermal area of Monterotondo Marittimo (Italy)

27-7 **19.15 - 19.30**
Malusà M.G.*, Brandmayr E., Panza G.F., Romanelli F., Ferrando S. & Frezzotti M.L. : Implications of the December 2020 Milan earthquake for the carbon emission budget of non-volcanic collisional settings

S.28 A journey into Earth's upper mantle: spotlights on its composition, structure and dynamics

The composition and structure of Earth's lithospheric mantle are essentially inferred from petrological and geochemical studies of exposed mantle sections, ophiolites and xenoliths from cratonic and non-cratonic areas. These few natural samples preserve an integrated, fragmentary record of a wide spectrum of multistage processes, such as melt extraction, recycling of volatiles and crust and interaction with metasomatic fluids and melts. Understanding the many facets of Earth's lithosphere structure and dynamics and their implication for large-scale geological cycles requires a multidisciplinary approach. Therefore, geochemical-petrological studies on natural samples must be complemented with - and compared to - thermodynamic modelling, laboratory experiments at high pressure and temperatures as well as geophysical data. This session will bring together multidisciplinary studies with the aim to explore and discuss the new findings on the physico-chemical state, dynamics and structure of the

lithosphere. Contributions from a broad range of disciplines, including - but not limited to - petrography, geochemistry, experimental petrology, thermodynamic modelling and geophysics are welcomed. Multidisciplinary contributions linking results to large-scale geodynamic processes are strongly encouraged.

Presentazioni orali

28-1 **11.00 - 11.15**
[KEYNOTE] Aulbach S.*, Lin A., Stagno V. & Caracausi A. : Formation of wehrlite in the shallow lithosphere beneath intra-continental rifts and basins, and its link to the volatile cycle

28-2 **11.15 - 11.30**
Borghini G.*, Fumagalli P., Arrigoni F., Klemme S., Rampone E. & Tiepolo M. : Trace element re-distribution in clinopyroxene via reactive melt infiltration of mantle peridotite: an experimental study at 1-2 GPa

28-3 **11.30 - 11.45**
Mariani D.*, Tribuzio R. & Zanetti A. : Origin of dunites adjacent to the mantle peridotite massif of Balmuccia (Ivrea-Verbano Zone, Italian Alps)

28-4 **11.45 - 12.00**
Notini L.*, Rampone E., Scambelluri M., Tommasi A., Zanetti A., Ferri F. & Rodríguez-Vargas A. : Petrology and textures of mantle-wedge xenoliths from the Northern Andes (Mercaderes area, Colombia)

28-5 **12.00 - 12.15**
Sani C.*, Sanfilippo A., Peyve A.A., Genske F. & Stracke A. : Variable depletion signatures in the oceanic upper mantle

28-6 **12.15 - 12.30**
(Invited) Rizzo A.L.* & Coltorti M. : The composition of noble gas and CO_2 in the European subcontinental lithospheric mantle

28-7 **12.30 - 12.45**
Sandoval-Velasquez A.*, Rizzo A.L., Aiuppa A. & Coltorti M. : The radiogenic nature of the lithospheric mantle beneath Lanzarote (Canary Islands)

28-8 **12.45 - 13.00**
Ventura Bordenca C., Faccini B.*, Coltorti M., Di Muro A., Caracausi A., Rizzo A.L., Liuzzo M., Aiuppa A. & Pik R. : The nature of the mantle beneath La Grille volcano (Grande Comore Island, western Indian Ocean) as revealed by mineral chemistry, noble gas geochemistry and CO_2 abundance in ultramafic mantle xenoliths

S.29 Stressed minerals and microstructures: a link between grain-scale processes and lithosphere dynamics

Rock-forming minerals and their micro-structures represent a fundamental window to the processes occurring in the Earth crust and interior. The occurrence in rocks of key minerals such as coesite, diamond and majorite poses a fundamental first order approximation on the stress field under which the rock formed or recrystallized. However, recent advances in Earth Sciences aim to resolve in more details the influence of stress in geological processes. This is possible thanks to the introduction of high-performance experimental and computational techniques in the Earth sciences that allow us studying the behaviour of minerals and rocks (e.g. elastic response, defects, phase equilibria and transformations etc.) under hydrostatic or non-hydrostatic stress conditions with unprecedented detail. The knowledge of the response of geomaterials to stress at the micro and meso-scale can then be linked to large-scale rock deformation mechanisms, and represents a fundamental framework to better interpret geological processes. In this session, we welcome contributions adopting a broad variety of experimental and computational techniques to investigate the effect of stress on minerals, rocks and their physical properties from the microscopic to the macroscopic scale.

Presentazioni orali

29-1 **15.30 - 15.45**

[KEYNOTE] Macente A.*, Fusseis F., Butler I.B., John T., Menegon L., Tudisco E., Hall S., Andò E. & Vanorio T. : Fluid-rock interactions in nature and in the laboratory: through time and space using X-ray Computed Tomography

29-2 **15.45 - 16.00**

Tesei T.*, Pozzi G., Schorn S. & Holdsworth R.E. : Squishing and breaking amphibolites along a major thrust: the example of the Ben Hope Sill, Moine Supergroup, NW Scotland

29-3 **16.00 - 16.15**

Griffiths A.T.*, Musu A., Habler G., Peres S., Petrelli M. & Caricchi L. : Crystal alignment and clustering during crystallisation of experimental basalt under strain

29-4 **16.15 - 16.30**

Ferrando C.*, Basch V., Ildefonse B., Deans J., Sanfilippo A., Barou F. & France L. : Microstructures of olivine gabbros from the Atlantis Bank OCC (SWIR): Role of compaction in melt extraction and accumulation at a slow spreading center

29-5 **16.30 - 16.45**
[KEYNOTE] Di Toro G.*, Aretusini S., Chinello M., Cornelio C., Del Rio L., Feng W., Gomila R., Masoch S., Nielsen S., Pennacchioni G., Spagnuolo E. & Tesei T. : Mineral reactions during earthquakes

29-6 **16.45 - 17.00**
(Invited) Manzotti P.*, Schiavi F., Nosenzo F., Pitra P. & Ballèvre M. : A journey towards the forbidden zone: a new, cold, UHP unit in the Dora-Maira Massif (Western Alps)

29-7 **17.00 - 17.15**
(Invited) Tacchetto T.*, Reddy S., Saxey D., Fougerouse D., Rickard W. & Clark C. : Disorientation control on trace element segregation in fluid-affected low-angle boundaries in olivine

29-8 **17.15 - 17.30**
Baratelli L.*, Cámara F. & Mihailova B. : Raman spectroscopic study of omphacite at variable pressures

S.30 A petrographic and mineralogical journey through the extraterrestrial bodies: from differentiated to undifferentiated materials

The study and exploration of extraterrestrial bodies and their mineral components are of fundamental importance to better understand the processes involved in the origin and evolution of our Solar System. Looking forward to a sustainable future, the planetary geological community is deeply involved in the developments of last-generation techniques and new methodological approaches to improve the investigation of asteroidal and planetary bodies from the direct study of extraterrestrial materials (e.g. meteorites, micrometeorites, interstellar grains, sample return materials) and laboratory experiments, to the indirect study of planetary surfaces through remote hyperspectral analyses. Moreover, an increasing interest in exoplanet explorations is developing thanks to the new research frontiers. The aim of the session is to bring together scientists from different backgrounds to enhance discussion and have the opportunity to establish new collaborations. We encourage contributions that cover studies from the petrological, petrographic and mineralogical investigation, as well as laboratory activities on differentiated and undifferentiated extraterrestrial materials or analogues. In addition, we welcome contributions covering studies about hyperspectral analyses of extraterrestrial bodies, exoplanets and astrobiology.

Presentazioni orali

30-1 **08.30 - 09.00**
[KEYNOTE] Pittarello L.*, Chernonozhkin S.M., Ferrière L., Roszjar J., Goderis S. & Rider-Stokes B. : Stony achondrite meteorites: just normal rocks!

30-2 **09.00 - 09.15**
(Invited) Stephant A.*, Anand M., Zhao X. & Franchi I.A. : Protosolar hydrogen source for water in the Moon and the Early Earth: insights from nominally anhydrous minerals

30-3 **09.15 - 09.30**
Day J.M.D.*, Lustrino M. & the IUGS Subcommission on the Systematics of Igneous Rocks : IUGS classification of extra-terrestrial igneous rocks

30-4 **09.30 - 09.45**
Mingardi G.*, Im S., Park J.W., Langone A. & Mari N. : Martian mantle heterogeneities inferred from in situ analyses of shergottites

30-5 **09.45 - 10.00**
Bragagni A.*, Wombacher F., Kirchenbaur M., Braukmüller N. & Münker C. : Tin isotopes in chondrites and Earth: mass independent isotope fractionation and radiogenic ^{115}Sn

30-6 **10.00 - 10.15**
Fastelli M.*, Comodi P., Schmitt B., Beck P., Poch O. & Zucchini A. : The reflectance spectra of NH_4^+-bearing minerals: the effects of temperature, granulometry and viewing geometry

30-7 **10.15 - 10.30**
La Fortezza M.*, Menescardi F. & Belmonte D. : *Ab initio* thermodynamics of $MgSiO_3$ protoenstatite at high temperatures and implications for planetary processes

S.31 Towards modern concepts in seismotectonic-model definition and imaging: multidiscipli…

Seismotectonic studies are key for seismic hazard assessment in tectonically and volcano-tectonically active regions. Defining a seismotectonic model is challenging since sometimes several conditions (e.g., paucity of geological- and surface deformation data) can hamper the accurate definition of active faults geometry, kinematics and of associated stress- and deformation fields. In addition, areas subjected to these studies are often characterized by low-level seismicity. Nowadays, advances in technology and scientific computing, allow the acquisition of large amounts of geological data even in formerly-unreachable places, make geophysical field data more effective and

data processing less demanding, allow enhancing seismic catalogs in areas with low-level seismicity and provide information from geophysical, geodetic, or remote-sensing analysis. Therefore, improvements of quality data and easier dataset integrations are more and more attainable, and seismotectonic model definition/imaging are increasingly realistic and reliable. This session aims at focussing on seismotectonic models, data and aspects that contribute to define them, and welcomes contributions on: active faults studies, including multiscale and multidisciplinary approaches; dataset integration for faults imaging and tectonic-setting definition; high-quality seismological data, field- and remotely-collected data for qualitative and quantitative analysis; numerical and analogue modelling of faulting processes; innovative methodologies for data collection and analysis.

Presentazioni orali

31-1 **08.30 - 08.45**
[KEYNOTE] Lavecchia G.* : Overtime tectonic, dynamic and rheological control on destructive MUltiple Seismic Events. Special faults & earthquakes in southern Italy: PRIN Project MUSE 4D

31-2 **08.45 - 09.00**
Giuffrida S.*, Brighenti F., Cannavò F., Carnemolla F., De Guidi G., Barreca G. & Monaco C. : A multidisciplinary analysis for a 3D modelling application in seismotectonic: The case study of Quaternary Faults in southern Calabria

31-3 **09.00 - 09.15**
Ercoli M.*, Carboni F., Akimbekova A., Carbonell R. & Barchi M.R : Enhancing fault patterns on the deep seismic reflection line CROP-04 through data pre-conditioning and seismic attributes

31-4 **09.15 - 09.30**
Feriozzi F.*, Improta L., Maesano F.E., De Gori P. & Basili R. : 3D crustal structure of the Irpinia region (Southern Apennines): constraints from the integration of subsurface data and local earthquake tomography

31-5 **09.30 - 09.45**
Diaferia G.*, Valoroso L., Improta L. & Piccinini D. : Earthquake catalogue enhancement through template matching: an application to the Southern Apennines (Italy)

31-6 **09.45 - 10.00**
Miccolis S.*, Carafa M.M.C., Filippucci M., Merryman Boncori J.P. & Tallarico A. : Seismic and geodetic monitoring of the Gargano promontory (Southern Italy)

31-7 **10.00 - 10.15**
Monaco C.*, Barreca G., Bruno V., De Guidi G., Ferlito C., Gambino S., Gutscher M.-A., Gross F., Mattia M. & Scarfì L. : Geological, seismological and geodetic evidence of recent deformation along the Alfeo-Etna Fault System (western Ionian Sea)

31-8 **10.15 - 10.30**
Carducci A.*, Andrenacci C. & Lavecchia G. : A combined seismologic-kinematic approach for 3D *b*-value zonation in Southern California

31-9 **11.00 - 11.15**
[KEYNOTE] Caputo R.* & NASA4SHA Working Group : Building a new generation of seismotectonic models (northern Apennines, Italy): the ongoing PRIN projects NASA4SHA

31-10 **11.15 - 11.30**
Fonzetti R.*, Valoroso L., De Gori P. & Chiarabba C. : Faults and fluids interaction during the Emilia 2012 seismic sequence

31-11 **11.30 - 11.45**
Carboni F., Porreca M.*, Cenci G., Valerio E., Manzo M., De Luca C., Ercoli M., Occhipinti M., Barchi M.R. : The role of lithology distribution and tectonic structures in controlling coseismic surface deformation inferred by geological and DInSAR data

31-12 **11.45 - 12.00**
Paoletti V.*, Fedi M., Florio G., Bruno P.P.G., Nappi R. & Cella F. : Geophysical Modeling in Seismotectonic Analysis

31-13 **12.00 - 12.15**
Zaccagnino D.*, Telesca L. & Doglioni C. : How details of faulting affect large scale properties of seismicity and tectonics

31-14 **12.15 - 12.30**
Volpe G.*, Pozzi G., Carminati E., Barchi M.R., Scuderi M.M., Tinti E., Aldega L., Marone C. & Collettini C. : Frictional control on the base of the seismogenic zone: insights from the Apenninic basement, Central Italy

31-15 **12.30 - 12.45**
Romano M.A.*, Carbone L., Cipressi G.M., de Nardis R., Vuan A., Lavecchia G., Peruzza L. & Priolo E. : Enhanced microseismicity catalogue in the Southern Abruzzi area (Central Apennine, Italy) and seismotectonic implications

31-16 **12.45 - 13.00**
Lavecchia G., Bello S.*, Andrenacci C., Cirillo D., Ferrarini F., de Nardis R., Roberts G. & Brozzetti F. : QUaternary fault strain INdicators database - QUIN 1.0 - first release from the Apennines of central Italy

S.32 From Source to Sink - the history of sediments inferred from the geological record

The history of sediments, from their production to their deposition can be very complex, because sediments are not directly transferred from a single source to a single sink along a simple conduit. In most cases numerous sediment sources provide detritus to multiple temporary storage through a network of pathways. The reconstruction of this intricate history from the geological record can be very challenging. The geographical origin of the detritus has been inferred using compositional data and paleocurrent indicators. Provenance data, framed into a detailed stratigraphic picture permit the calculation of the volume of produced and accumulated sediments. Researches from ancient and modern alluvial, coastal and marine systems are welcome. We encourage contributions focusing on the following aspects of the source-to-sink realm: (i) compositional characterization of sediments; (ii) dispersal pathways of organic and inorganic detritus; (iii) calculation of sediment volumes transferred to a basin; (iv) sediment-budget-related geomorphological-environmental changes; (v) processes and mechanisms of sediment production, routing and accumulation; (vi) evolution of sedimentary basins in response to changes in sediment supply and accommodation; vii) source-to-sink approach applied to carbonate systems; viii) the siliciclastic-carbonate mixed realm. The practical impact and the economic and social relevance of this research shall also be highlighted.

Presentazioni orali

32-1 **11.00 - 11.30**
[KEYNOTE] Amorosi A.* : Sediment routing systems and their stratigraphic record

32-2 **11.30 - 11.45**
Usman M.*, Garzanti E. & Vezzoli G. : Tracing sediment provenance in the Shaotanghe River (southwest China)

32-3 **11.45 - 12.00**
Tentori D.*, Mancini M., Milli S., Stigliano F., Tancredi S. & Moscatelli M. : Compositional, micromorphological and geotechnical characterization of Holocene Tiber floodplain deposits (Rome, Italy) and stratigraphic implications

32-4 **12.00 - 12.15**
Ruberti D.*, Buffardi C. & Vigliotti M. : The fate of the Volturno delta (northern Campania, Italy) among geological history and human influence

32-5 **12.15 - 12.30**
Olivetti V*., Balestrieri M.L., Zurli L., Perotti M., Pace D., Chew D., Cornamusini G. & Zattin M. : Oligocene-Miocene ice volume

variations in the Ross Sea, Antarctica: insight from a provenance study on core DSDP270 empowered by U-Pb dating, apatite geochemical signature and fission-track data.

32-6 **12.30 - 12.45**

Bracchi V.A.*, Varzi A.G., Savini A., Bazzicalupo P., Fallati L., Rosso A., Sanfilippo R., Guido A., Leonardi R., Negri M.P. & Basso D. : Coralligenous carbonate production through a multiscale approach: the case study of the CRESCIBLUREEF project (Ionian Sea, Italy)

32-7 **12.45 - 13.00**

Corrado S.*, Vergara N.A., Schito A., Michel P. & Gasparrini M. : New integrated geochemical and petrographic constraints to paleo-thermal and paleo-environmental reconstructions from organic matter dispersed in the Early Toarcian organic-rich shales of the Paris Basin (France)

S.33 Taphonomy and diagenesis of marine biogenic sediments in ancient and modern depositional environments

Marine biogenic sediments comprise a wide array of deposits (e.g., calcareous and siliceous oozes, phosphorites, organic-rich shales) deriving from the metabolic activity, accumulation or decay of forms of life ranging from bacteria to phyto- and zooplankton, up to vertebrates. They represent an excellent tool for paleoclimatic and paleoceanographic reconstructions, as well as for studying the evolutionary trends of primary producers and consumers in the geologic time. Moreover, they constitute a primary target for addressing the impact of anthropogenic pressure on the marine biogeochemical cycles and for predicting the future climatic trends. However, these applications must carefully consider the taphonomic and diagenetic processes that may potentially affect the marine sediments and their paleobiological content, in order to avoid biased interpretations. This session is aimed at providing new insights about such processes, discussing case studies from both ancient and modern depositional settings. We encourage multidisciplinary contributions dealing with different aspects (e.g., sedimentology, paleobiology, biogeochemistry, etc.) and techniques (e.g., petrographic observations, 3D imaging of body fossils, biomarkers and isotope analysis, etc.) of this issue.

Presentazioni orali

33-1 **15.30 - 16.00**
[KEYNOTE] Michalopoulos P.* : Reverse Weathering: Past, Present and Future

33-2 **16.00 - 16.15**
Bojanowski M.J.*, Ciurej A., Dubicka Z., Minoletti F. & Olszewska-Nejbert D. : Il buono, il brutto, o il cattivo? The role of diagenetic alteration of coccolith-rich rocks in constraining the palaeoceanographic setting

33-3 **16.15 - 16.30**
Cipriani M.*, Basso D., Bazzicalupo P., Bertolino M., Bracchi V.A., Bruno F., Costa G., Dominici R., Muzzupappa M., Rosso A., Sanfilippo R., Sciuto F. & Guido A. : Autochthonous *vs* allochthonous micrite in Mediterranean coralligenous: ecological and depositional implications

33-4 **16.30 - 16.45**
Cornacchia I.*, Brandano M., Agostini S. & Munnecke A. : When was the Mediterranean water body born? What the Nd isotope record of Miocene phosphatic hardgrounds is telling us

33-5 **16.45 - 17.00**
Geniram A.*, Colizza E., Melis R., Torricella F., Tesi T., Pambianco G., Miserocchi S., Gallerani A. & Colleoni F. : LGM – Holocene West Antarctic Ice Sheet evolution by multidisciplinary analysis of five gravity cores collected in the Glomar Challenger (Eastern Ross Sea, Antarctica)

33-6 **17.00 - 17.15**
Mansour B.*, Bachiri N., Mennad S. & Saint Martin J.P. : Reconstructing paleoenvironment and taphonomic processes from Messinian diatomaceous sediments of the Lower Chelif basin (NW Algeria)

33-7 **17.15 - 17.30**
Nallino E.*, Gennari R., Mancini A.M., Pellegrino L., Pilade F. & Lozar F. : High-resolution investigation of a pre-evaporitic Messinian precessional cycle in the Pecetto di Valenza section (NW Italy): from sapropel to diatomite deposition as revealed by stable isotope and morphometric analyses on planktic and benthic foraminifera

S.34 The Sediment Routing System as a tool to the understanding of fossil depositional system and the preservation of modern ones

This session focused on the crucial factors controlling the composition of clastic sediments as cumulative effects of modifications occurring between the initial erosion of the parent rocks and the final burial during diagenesis. We encourages contributions in which the use of petrography and geochronology of terrigenous/hybrid arenites highlight the record of tectonics in clastic archives and dispersal pathways within basins, quantifying sedimentary budgets, useful for paleogeographic and paleotectonic reconstructions, as well as in petroleum and mineral exploration. We invite interdisciplinary researchers working on all aspects of basin analysis (from source to sink) across different temporal and spatial scales and on a variety of depositional processes and systems (clastic, carbonates, mixed). We welcome field, experimental and modelling studies, as well as sedimentological, geochemical, structural, geochronological, paleogeographic, provenance and marine geology investigations.

Presentazioni orali

34-1 **17.30 - 17.45**
[KEYNOTE] Critelli S.* : Interpreting provenance relations from detrital modes of Circum-Mediterranean sandstones in relation to tectonic setting

34-2 **17.45 - 18.00**
Criniti S.*, Critelli S., Costamagna L.G., Di Stefano P. & Sulli A. : Composition and provenance of Late Carboniferous to Permian sandstones within the Circum-Mediterranean region

34-3 **18.00 - 18.15**
[KEYNOTE] Gallicchio S.*, Cerone D., Fornelli A., Maiorano P. & Micheletti F. : Late Paleogene trench-slope syn-sedimentary volcaniclastic turbidites of the Candela Stream (Southern Italy). New constrains for the geodynamics of the Southern Apennine in the Central Mediterranean

34-4 **18.15 - 18.30**
Civitelli M.*, Criniti S., Borrelli M. & Critelli S. : Sandstone diagenesis and petrophysics of San Mauro formation (Cilento group), Southern Apennines, Italy

34-5 **18.30 - 18.45**
Micheletti F.*, Festa V., Fornelli A., Tursi F. & Spalluto L. : Petrography and Geochemistry of post-Cretaceous Bauxite from Murge Area (Apulia, southern Italy): A Provenance Tool

34-6 **18.45 - 19.00**
Le Pera E.*, De Luca R., Miriello D., Pugliese E. & Tangari A.C. : Heavy minerals provenance in modern beach and fluvial sands of the Betic Cordillera (Spain)

34-7 **19.00 - 19.15**
Lapietra I.*, Lisco S.N., Milli S. & Moretti M. : Sand provenance of Le Dune and Torre Guaceto beach (Southern Italy)

34-8 **19.15 - 19.30**
Cossu G.*, Sechi D., Pascucci V. & Andreucci S. : A reliable geochronological method for Quaternary gravelly marine terraces covers: luminescence Rock Surface Dating performed on Cala Mosca and Cala Viola areas (Sardinia, Italy)

S.35 Field mapping and stratigraphy: significant insights from the geologic record

Field-based geological mapping represents the most valuable tool to obtain new stratigraphic data. Palaeoecological perturbations, synsedimentary tectonics and sea-level fluctuations controlled the deposition of marine to continental deposits in the peri-Mediterranean area since the Late Palaeozoic, as recorded in the stratigraphic successions of different palaeogeographic domains. These successions are imbricated and exhumed due to orogenic/post-orogenic deformations, or uplifted in forebulge areas, and are unconformably covered by Neogene-Quaternary deposits. Their knowledge can be enhanced by performing detailed observations and descriptions on the field. The application of the classical methodologies of geological mapping, associated with new tools derived from the evolution of scientific knowledge and advances in technology, continuously provide new sedimentological and stratigraphic cues. The aim of this session is to discuss new stratigraphic reconstructions from national to peri-Mediterranean continental, shallow, and deep marine environments, derived from field mapping projects also considering the renewed funding of the official geological mapping project at 1:50,000 scale (CARG Project). Contributions may focus on stratigraphy and tectono-stratigraphic evolution of sedimentary basins, new methodologies of collection, storage, and restitution of field data, and new tools for elaboration and construction of geological models starting from 2D geological maps.

Presentazioni orali

35-1 **08.30 - 08.45**
Barale L., Bertok C., d'Atri A.,Martire L., Mosca P. & Piana F.* : Mapping sedimentary and low-grade metasedimentary rocks: the Geologic Event approach

35-2 **08.45 - 09.00**
Irace A.*, Catanzariti R., Fioraso G., Da Prato S., Barbero E., Bonadeo L., Livio F., Ferrario F., Scaramuzzo E. & Zerboni A. : Geological map of Valenza-Montecastello area: new field constraints for the Oligocene-Quaternary tectono-stratigraphic evolution of the eastern Monferrato (NW Italy)

35-3 **09.00 - 09.15**
Barbero E.*, Festa A., Catanzariti R. & Fioraso G. : Early to middle Eocene tectono-sedimentary evolution of the External Ligurian accretionary wedge (Northern Apennines): constraints from the geological mapping of different types of chaotic rock units

35-4 **09.15 - 09.30**
Caggiati M.*, Gianolla P. & Riva A. : The Sciliar formation and its subunits: a tricky matter for mapping geology

35-5 **09.30 - 09.45**
Gianolla P.*, Caggiati M. & Riva A. : Anisian tectonics ruling sedimentation in the Eastern Southern Alps: evidence from CARG geological mapping

35-6 **09.45 - 10.00**
Marcelli I.*, Irace A. & Fioraso G. : The New Subsurface Geological Map of the Torino metropolitan Area (Western Po Plain): from database and 3D model construction to the map graphic representation

35-7 **10.00 - 10.15**
Pigazzi E.*, Apuani T. & Bersezio R. : Geological mapping as a tool for understanding the historical landscape evolution of an Alpine valley: the Piuro case study (Bregaglia Valley, SO)

35-8 **10.15 - 10.30**
Zuffetti C.*, Bersezio R., Lucchelli A., Stevenazzi S. & Masetti M. : From 2D geological maps to 3D models: A case-study in the Central Alps (Lombardy, Italy)

35-9 **11.00 - 11.15**
Locatelli M.*, Morelli D., Crispini L., Corradi N., Federico L., Cianfarra P. & Brandolini P. : The tectono-stratigraphic evolution of the alpine Ligurian margin: new insights from the marine Quaternary deposits (Albenga and Genova sheets - CARG project)

35-10 **11.15 - 11.30**
Marino M.* & D'Ambrogi C. : 3D stratigraphic architecture of the Permian-to-Cenozoic succession of the Po Basin

35-11 **11.30 - 12.00**
[KEYNOTE] Capotorti F.*, Marino M. & Muraro C. : Tectono-sedimentary evolution of Central-Northern Apennines in the geologic record of 348 “Antrodoco” and 337 “Norcia” Sheets

35-12 **12.00 - 12.15**
Chiarini E.* & Papasodaro F. : The continental Quaternary of the 337 Norcia and 348 Antrodoco Geological Sheets: new insights and cartographic implications

35-13 **12.15 - 12.30**
Muraro C.*, Vita L., Cipriani A., Consorti L., Battaglini L., Fiorentino A., Fiorenza D., Martarelli L., Orefice S., Pieruccioni D., Silvestri S. & Troccoli A. : The Glossary 3.0 of the CARG Project: An updated web-based controlled vocabulary of terms related to geological maps

35-14 **12.30 - 12.45**
Cipollari P.*, Abbassi A. & Cosentino D. : Closing the “Monte delle Fate” and “il Casone” tectonic windows: new insights from the CARG project 364-Bracciano

35-15 **12.45 - 13.00**
Artegiani F.* & Fagioli G. : Geological map of the Mt. Soratte ridge (central Apeninnes, Latium, Italy)

35-16 **17.30 - 17.45**
--- Withdrawn --- Nirta G.*, Barbero E., Festa A. & Remitti F. : Processes of ophiolite incorporation at shallow structural levels of subduction complexes: field constraints from the External Ligurian Units (Northern Apennines, Italy)

35-17 **17.45 - 18.00**
Invernizzi D.*, Felletti F., Marini M., El Kati I., Pantopoulos G., Reguzzi S. & Zuffetti C. : The Tachrift Project: combining field mapping and detailed stratigraphic measurements to reconstruct the sedimentary architecture of channel-levée systems (late Tortonian, Tachrift Turbidite System, NE Morocco)

35-18 **18.00 - 18.15**
Innamorati G.*, Aldega L., Fabbi S. & Santantonio M. : From Jurassic rifting to early Miocene shortening: polyphase history of the Longobucco/Paludi welded basins (northern Calabria)

35-19 **18.15 - 18.30**
Tancredi S.*, Margiotta S., Grasso S., Tentori D. & Milli S. : The Cenozoic paleogeographic evolution and sequence stratigraphy of the Salento Peninsula (southern Apulia platform)

35-20 **18.30 - 18.45**
Sulli A.*, Gasparo Morticelli M., Agate M., Todaro S., Lo Presti V., Bonfardeci A. & Avellone G. : The geological map of the Sheet 628 “Sciacca” (CARG Project)

35-21 **18.45 - 19.00**
Foti A.*, Catalano S., Tortorici G. & Salerno A. : The origin and the significance of the extensive detrital production along the western margin of the Hyblean Plateau (SE Sicily)

35-22 **19.00 - 19.15**
Salerno A.*, Foti A., Tortorici G. & Catalano S. : Geological and structural lineaments of Chiaramonte Gulfi area (Hyblean Plateau)

35-23 **19.15 - 19.30**
Gambino S.*, Barreca G., Pagano M., Carbone. & Monaco C. : Tectonic evolution of the eastern coastal area of the Hyblean region

S.36 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. We encourage contributions deriving from the ongoing Geological Map of Italy at the scale 1:50,000 - CARG Project.

Presentazioni orali

36-1 **15.30 - 16.00**
[KEYNOTE] Lirer F.* : Neogene-Quaternary Global Stratotype Section and Points: state of the art, weakness and strength and what is it missing?

36-2 **16.00 - 16.15**
Columbu A.*, Spötl C., Fohlmeister J., Hu H.-M., Chiarini V., Hellstrom J., Cheng H., Shen C.-C. & De Waele J. : Speleothem $\delta^{18}O$-$\delta^{13}C$ stratigraphy precisely constraining the Holocene inception in southern Italy (Sant’Angelo Cave, Apulia)

36-3 **16.15 - 16.30**
Zanola E.*, Di Stefano A., Fornaciari E., Ferretti P., Macrì P. & Capraro L. : A high-resolution record of $\delta^{18}O$ and $\delta^{13}C$ across the Piacenzian/Gelasian boundary at Monte San Nicola (Southern Sicily)

36-4 **16.30 - 16.45**
Brandano M.*, Cornacchia I., Ruscitto V. & Marianelli D. : Some issues on carbonate factory classification: insight from Upper Miocene *Lithothamnion* Limestone (Majella central Apennines, central Mediterranean)

36-5 **16.45 - 17.00**
Mannucci A.*, Gréteau L., Lanci L., Reghellin D. & Galeotti S. : Astrochronology of the C20n-C20r from the Contessa Quarry Billabong section (Gubbio, central Italy) and its implications for the geological time scale

36-6 **17.00 - 17.15**
Costamagna L.G.* : Triassic successions of Sardinia, Corsica and Brianconnais domain: analogies and correlations

36-7 **17.15 - 17.30**
Pecorari M.*, Gianolla P., Cruciani G., Tateo F. & Caggiati M. : Variations in mineral assemblages across the Carnian Pluvial Episode (Late Triassic): a composite section from the Dolomites

36-8 **17.30 - 17.45**
Sorci A.*, Cirilli S., Götz A.E., Servais T. & Spina A. : Understanding mechanisms of palaeoecological and palaeoclimatic trends across the Silurian-Devonian transition by palynofacies data from southern Tunisia

36-9 **17.45 - 18.00**
Stelletti M.*, Sechi D., Andreucci S., Cossu G., De Luca M., Faedda G., Perazzotti F., Ruperti N., Santonastaso A. & Pascucci V. : High-frequency climate oscillations determined with OSL in Lanzarote (Canary Island)

36-10 **18.00 - 18.15**
Thomas C.*, Ariztegui D., Antler G., Ebert Y., Grossi V., Ionescu D. & Levy E. : Traces of life in evaporites: the case of the Dead Sea deep biosphere and its relation to paleoclimate fluctuations

36-11 **18.15 - 18.30**
Sabino M.*, Birgel D., Natalicchio M., Dela Pierre F. & Peckmann J. : Perturbation of the carbon cycle in the late Miocene Mediterranean Sea at the advent of the Messinian salinity crisis revealed by lipids of marine Thaumarchaeota

36-12 **18.30 - 18.45**
Gibert L.*, Corbí H., García-Veigas J., Lozar F., Pineda V., Pérez-Valera F., Gil M., Artiaga D., Lería M. & Soria J. : A new MSC record in the Tabernas basin (SE Spain)

36-13 **18.45 - 19.00**
Borrelli M.*, Critelli S. & Perri E. : The Messinian Salinity Crisis in the Central Mediterranean: Paleogeography and sedimentary evolution of two North Calabria basins (South Italy)

36-14 **19.00 - 19.15**
Pineda V.* & Gibert L. : The Latest Tortonian saline deposits of the Granada Basin: A marine to continental evaporite record of an ancient hypersaline lagoon

36-15 **19.15 - 19.30**
Cipriani M.*, Dominici R., Costanzo A., Cianflone G., Miriello D., Perri F. & Guido A. : Organic matter remains in primary evaporitic minerals: new insights on paleoenvironmental conditions and mineral crystallization during the Messinian Salinity Crisis

S.37 Sustainability of groundwater resources

Groundwater is a hugely important natural resource for human activities and the maintenance of ecosystems. However, human activities and, more recently, climate change impact on both the quality and quantity of available groundwater. With a view to sustainable development, the use of groundwater resources should meet current and future beneficial uses without causing unacceptable environmental, social and economic consequences. In this context, the session intends to analyse topics related to sustainable groundwater resource development in the complex relationship between water-energy-food and climate change. This session encourages the submissions of all contributions on sustainability of groundwater resources used for drinking, irrigation, industrial and energy supplies. Basic and applied research concerning new approaches and models in the management, conservation and protection of groundwater in rural and urban environments are welcome. This session is sponsored by IAH – Italian Chapter.

Presentazioni orali

37-1 **15.30 - 16.00**
Miletto M.* : Groundwater, the invisible resource: findings from the UN World Water Development Report 2022

37-2 **16.00 - 16.15**
Lorenzi V., Banzato F., Barberio M.D., Manetta M., Sbarbati C. & Petitta M.* : Distributed groundwater recharge of the Gran Sasso aquifer (Central Italy) for a sustainable management: analysis and changes during 2000-2021 period

37-3 **16.15 - 16.30**
Cavallina C.*, Bergamasco A., Cosma M., Da Lio C., Donnici S., Tosi L. & Zaggia L. : Morpho-sedimentary constraints in the groundwater dynamics of low-lying coastal area: the southern margin of the Venice lagoon, Italy

37-4 **16.30 - 16.45**
Di Giovanni A.*, Di Curzio D., Rusi S. : Hydrogeological characterization and assessment of groundwater resource potentialities for drinking purposes of minor high-altitude springs in Central Apennines (Southern Abruzzo region)

37-5 **16.45 - 17.00**
Egidio E.*, Stevenazzi S., Ducci D., De Luca D.A., Mancini S., Corniello A. & Lasagna M. : How Italian groundwater are experiencing climate change: two examples of groundwater temperature variation from North to South

37-6 **17.00 - 17.15**
Fronzi D.*, Mammoliti E., Palpacelli S., Marcellini M., Ianni C., Tonelli M., Nanni T. & Tazioli A. : Characterization of aquifers and water balance calibration in the Laga Geological Formation (Marche Region, central Italy)

37-7 **17.15 - 17.30**
Lobina F.*, Da Pelo S., Biddau R., Cidu R., Coppola A. & Vacca A. : Effect of textural and hydrological properties of the soil on the residence time of infiltration water and in promoting denitrification processes in the unsaturated zone

37-8 **17.30 - 17.45**
Lana L., Lotti F., Petitta M., Piscopo V. & Sbarbati C.* : Sustainability indicators for groundwater withdrawals from the Acque Albule Basin (Rome)

37-9 **17.45 - 18.00**
Gizzi M.*, Mondani M. & Taddia G. : A Preliminary Analysis for Understanding Variations in Mountain Springs' Water Availability under Climate Change in Aosta Valley

37-10 **18.00 - 18.15**
Mastrorillo L.*, Viaroli S., Bolzonella E., Mazza R., Ruisi M. & Taviani S. : Post-seismic update of the hydrogeological setting of Sibillini Mts. system: a detail on the marchean fractured carbonate aquifers (Central Italy)

37-11 **18.15 - 18.30**
Mazzon P.*, Piccioli S., Colombo P. & Alberti L. : Numerical modelling of the Milano metropolitan area (Italy) to assess the relevance of irrigation recharge in prediction of future groundwater levels

37-12 **18.30 - 18.45**
Porru M.C.*, Da Pelo S., Davids T., Oude Essink G., Arras C. & Piscedda F.A. : Innovative methodological approach for the modeling of seawater intrusion in the coastal plain of Muravera (Sardinia, Italy)

37-13 **18.45 - 19.00**
Stevenazzi S.*, Lucchelli A., Del Gaudio E., Ducci D. & Masetti M. : Water availability evaluation for a sustainable management of groundwater resources in mountainous areas

37-14 **19.00 - 19.15**
Vespasiano G.*, Cianflone G., Marini L., De Rosa R., Andiloro G., Walraevens K., Vaselli O., Tolomei C., Pizzino L., Cinti D., Polemio M., Capecchiacci F., Dominici R. & Apollaro C. : Preliminary hydrogeological and geochemical characterization of the Gioia Tauro coastal Plain (Calabria - South Italy)

37-15 **19.15 - 19.30**
Vetuschi Zuccolini M.*, Canepa M., Parodi U. & Schenone D. : Impact of the extremal climatic event Alex (2-3/10/2020) on the geochemically vulnerable peri-Alpine Roja's aquifer

S.38 Geosciences and shallow geothermics for the energy transition and sustainability

Securing future energy supply is becoming a concern at both, the global and local scales. It will require reducing CO2 emissions via a sustainable energy transition from high-carbon fossil fuels such as oil and coal, towards renewable energy in association with cleaner energy production such as hydrogen To comply with fluctuating energy demands, energy storage in rock caverns and porous rocks in the form of hydrogen is now emerging as a challenging but attractive possibility. Other carbon and capture technologies, such as mineral carbonation in rocks and in alkali-rich materials (fly ash, steel slag, cement, waste materials) can complement our strategy to face the climate challenge toward an economic circularity. In this scientific session we invite any sort of innovative research to improve the current scientific, societal, economic, and environmental knowledge of the energy systems transition associated with or without CCS and CCUS. We also support any contribution looking at (i) regional and local characterization of storage formations ii) reservoir behaviour during Hydrogen or CO2 injection and storage (including modelling and analogue experiments) and their geomechanic risk associated (ii) Mineralogical CCS in rocks and alkali-rich materials. (iii) analysis of natural analogues of Hydrogen, CO2 storage and CO2 mineral sequestration.

Presentazioni orali

38-1 **08.30 - 08.45**
Tinti F.*, Rapti D., Caputo R., Perez Garcia C.A., Ceccarelli M., Santolini E. & Benni S. : Investigations and modelling for a practical application of borehole thermal energy storage

38-2 **08.45 - 09.00**
Belliardi M.*, Soma L., Perego R., Pera S., Di Sipio E., Zarrella A., Carnieletto L., Galgaro A., Badenes B., Pasquali R., Bertermann D. & Sanner B. : Recommendations for the planning and management of ground source heat pump systems in an urban environment, considering the effects of reciprocal thermal interference

38-3 **09.00 - 09.15**
Antelmi M.*, Turrin F., Zille A. & Fedrizzi R. : Simulation of groundwater flow energy contribution in BHE systems by means of an adapted TRNSYS-type for HVAC systems design

38-4 **09.15 - 09.30**
Barbieri S.*, Antelmi M. & Alberti L. : Numerical modeling and validation of a thermal response test through the MODFLOW-USG code for ground source heat pump design support

38-5 **09.30 - 09.45**
Chicco J.M.*, Mandrone G., Vacha D., Tartaglino A. & Fonte L. : Shallow geothermal heating for plant phenotyping greenhouses: a case study in NW Italy

38-6 **09.45 - 10.00**
(Invited) Perego R.*, Dalla Santa G., Galgaro A. & Pera S. : Intensive thermal exploitation from closed and open shallow geothermal systems at urban scale: unmanaged conflicts and potential synergies

38-7 **10.00 - 10.15**
Massa M.*, Cruciani G., Vola G., Sarandrea L., Bresciani P. & Ardit M. : Carbonation of Ca-rich materials: thermal activation at ambient pressure

38-8 **10.15 - 10.30**
Robledo F.*, Butler R. & Bond C.E. : Influence of fault interpretation methodologies on fault geometry and the accuracy of their statistics

S.39 Innovative strategies for sustainable agriculture and restoration of degraded soils: novel approaches, technologies, and case studies

Intensive farming, as well as mining, are worldwide drivers of soil, water, and atmospheric pollution. In this optic, there is an urgent need to implement sustainable methodologies which help to preserve these fundamental non-renewable environmental resources. The development and evaluation of novel eco-friendly and cost-effective "green" methodologies for the preservation and restoration of these environmental compartments require a multidisciplinary approach encompassing geoscience, agronomy, biology, and engineering. With this session, we aim to focus on the current research and latest advances on a wide spectrum of strategies, including (but not limiting to) the use of minerals (eg. Zeolites, struvite etc.) or organic amendments (biochar, compost etc.) for promoting the more efficient use of nutrients in agriculture (N and P) and for the restoration of degraded soils, covering biological, chemical-physical, biochemical, and environmental aspects. Young researchers and PhD students are encouraged to submit their contributions.Contributions may be focused on: (i) Natural and synthetic sorbents: characterization; adsorption of pollutants; influence on mobility and leaching of target elements in soil and water; (ii) Strategies for mitigating GHG emissions from agricultural soils; (iii) Bioremediation through plants and/or microorganisms; (iv) Valorization and recycling of waste; (v) Examples of field and laboratory experiments; (vi) Effects of bio-geo materials on soil nutrient cycling.

Presentazioni orali

39-1 **11.00 - 11.15**

Comodi P.*, Cambi C., Fastelli M., Sassi P., Pandolfi E.B., Pioppi L. & Zucchini A. : Use of biomass ashes for the treatment of expansive clayey soils for sustainable pavement construction

39-2 **11.15 - 11.30**

Delgado J., Barba-Brioso C.*, Ayala D. & Romero-Baena A.J. : Metal retention in a controlled storage mine wastes system in Zaruma-Portovelo province (S Ecuador)

39-3 **11.30 - 11.45**

Barba-Brioso C.*, Jiménez J., Delgado J., Martín D., Romero-Baena A.J. & González I. : Recycled concrete aggregates as a component of technosols for acid mine drainage remediation. Laboratory leaching test

39-4 **11.45 - 12.00**

Romero-Baena A.J.*, Delgado J., Barba-Brioso C., Miras A., Martín D., Campos P. & González I. : Geochemical characteristics of mine wastes reclaimed for agricultural purposes at the east of Seville Province (Southern Spain). Preliminary results

39-5 **12.00 - 12.15**
Morrone L.*,Rotondi A., Faccini B., Medoro V. & Coltorti M. : Zeolite applications in olive growing: field experience in Emilia Romagna

39-6 **12.15 - 12.30**
Galamini G.*, Ferretti G., Rosinger C., Huber S., Medoro V., Mentler A., Diaz-Pines E., Faccini B., Coltorti M. & Keiblinger K.M. : Soil amendments with slow-release fertilizer properties show distinct responses in short-term incubations in a sandy arable soil

39-7 **12.30 - 12.45**
Deltedesco E.* & Haas F. : Soil organic carbon and soil microbial diversity in vineyard agroecosystems under cover crop management practices

39-8 **12.45 - 13.00**
Stravisi A.*, Pasut D. & Santaliana D. : BeeDiversity: innovation and technology in apiculture for habitat management and conservation

S.40 Environmental geology supporting the European Green Deal

The European Green Deal recognises the environment as a source of natural and economic prosperity for Europe's future. Its priorities include the protection of biodiversity and ecosystems, the reduction of air, water and soil pollution, the transition towards a circular economy, the improvement in waste management and the development of a sustainable blue economy. Environmental geology, with its multidisciplinary field of applied sciences, supports these key areas focusing on the relationships between human activities and the physical environment. The study of this interaction and the related risks is fundamental for improve the health and quality of life of citizens, address environmental problems and for turning environmental challenges into opportunities that make economy environmentally sustainable. This session is intended to examine the progress toward these challenging goals. Contributions that deal with the various aspects of human-environment interaction by means of innovative approaches are welcome, in particular regarding i) impact of resources' exploitation, ii) assessment of hazardous phenomena, iii) environmental risks' evaluation, reduction, and management, iv) waste management, v) soil and coastal erosion.

Presentazioni orali

40-1 **17.30 - 17.45**
Vagnon F.*, Umili G., Bianco I., Blengini G.A., Costanzo D., Dino G.A., Ferrero A.M., Migliazza M., Taboni B. & Vinciguerra S.C. : Rapid landslide risk mitigation: design for sustainability criteria in mountain areas

40-2 **17.45 - 18.00**
Argentieri A.*, Cristofalo G.C., Fabiani M., Marchetti M., Piacenza M., Rotella G. & Taliana D.M.R. : Risk evaluation and management in lacustrine environment: bathymetric and morphologic survey of Martignano and Bracciano lakes (metropolitan area of Rome, Italy)

40-3 **18.00 - 18.15**
Danala D.S.*, Ekengele N.L., Vorster C., Bitom D.L. & Kramer J.D. : Petrology of gold rich soil and impact of gold mining on soils in Meiganga area (Adamaoua Plateau, Cameroun)

40-4 **18.15 - 18.30**
Maccelli C.*, Natali C., Nisi B., Casalini M., Vaselli O., Venturi S. & Avanzinelli R. : Geochemistry and radiogenic isotopes of total suspended solids (TSS) from the Nievole River Valley (Tuscany, Central Italy)

40-5 **18.30 - 18.45**
Montefinese S.*, Benvenuti M., Buccianti A., Costagliola P., Fornasaro S., Lattanzi P., Morelli G. & Rimondi V. : Mercury in Quaternary sediments of the Paglia-Pagliola River system (Monte Amiata)

40-6 **18.45 - 19.00**
Mattia M., Tuccimei P.*, Soligo M., Briganti A., Voltaggio M., Carusi C. & Rainaldi E. : Limits and applications of the radon deficit technique for the study of two sites contaminated by NAPLs (Non-Aqueous Phase Liquids)

40-7 **19.00 - 19.15**
Portaro M.*, Tuccimei P., Galli G., Soligo M., Longoni C. & Vasquez D. : Testing Waterproofing products used in the construction industry to retain radon released from building materials and soil

40-8 **19.15 - 19.30**
Invernizzi C.*, Gambini R., Mazzoli S., Memmo V., Pasquini G., Pierantoni P.P., Sansone F., Teloni R., Tondi E. & Zambrano M. : Geothermal reservoir characterization and exploitation scenarios for the Acquasanta Terme area (Laga foredeep basin, Marche region)

S.41 Evolution of the Variscan crust

The Variscan belt is the result of a complex geodynamic history starting in the Cambro-Ordovician with the break-up of Gondwana, rifting, subduction, and ends up with multiple continental collisions and shearing in Carboniferous-Permian times. Several processes contributed to generate the Variscan crust during this long-lasting evolution that ultimately lead to the formation of Pangea. The pre-Variscan evolution is characterized by rifting and subsequent subduction of different terranes and records net crustal growth by magmatic underplating and development of huge, long lasting volcanic arcs. Later, during continental collision and exhumation, the thickened Variscan crust has been affected by various sedimentary, magmatic, and tectono-metamorphic processes. It is worth noting that economically relevant ore deposits formed during all these phases. In this session, we welcome contributions that discuss the evolution of the Variscan crust using different approaches encompassing, but not necessarily limited to, paleontological, stratigraphic, structural, geophysical and petro-chronological 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..

Presentazioni orali

41-1 **17.30 - 18.00**
Oggiano G.* : Sardinia a key area for the Variscan geology: main achievements in half-century of research

41-2 **18.00 - 18.15**
Cruciani G.*, Franceschelli M. & Fancello D. : Trace-element zoning in garnet from mylonitic micaschist of NE Sardinia

41-3 **18.15 - 18.30**
Petroccia A.*, Lanari P., Forshaw J., Carosi R., Montomoli C., Iaccarino S. & Vitale Brovarone A. : Constraining P-T conditions in low-grade metapelites: a case study from the hinterland-foreland transition zone of the Variscan belt, Sardinia

41-4 **18.30 - 18.45**
Stori L.*, Ros Franch S., Márquez-Aliaga A., Goy A., Marquez-Sanz L., López-Gómez J., Martín-Chivelet J. & Ronchi A. : Ladinian biostratigraphic data from Sardinia (Italy) as a tool to reconstruct the Tethys transgression in Western Paleoeurope

41-5 **18.45 - 19.00**
Accotto C.*, Martínez Poyatos D. J., Azor A., Simancas F., González Lodeiro F. & Pedrera A. : Late Cambrian-Early Ordovician transcurrent displacement of the Ossa-Morena Zone along the northern Gondwanan margin revealed by U/Pb detrital zircon systematics

41-6 **19.00 - 19.15**
Russo D.*, Fiannacca P., Mamtani M.A., Fazio E. & Cirrincione R. : A combined field, microscopic and magnetic approach to infer structural evolution mechanisms of the upper crust: an example from Serre Massif (southern Italy)

41-7 **19.15 - 19.30**
Roda M.*, Spalla M.I., Filippi M., Rebay G., Regorda A., Zanoni D., Zucali M., Lardeaux J.M. & Gosso G. : Remnants of the Variscan chain across the Alps: metamorphic vs. tectonic evolution

S.42 Faults and shear zones: the pathways for fluids

Faults and shear zones are preferred pathways for fluids and the interactions between fluid flow and mylonitic or cataclastic rock network strongly influence the mechanical behavior and rheological properties of the crust. Fluid interaction turns rocks stiffer or weaker and changes their permeability both in space and time. Also, understanding fault hydraulic properties is crucial for studies of fluids migration (including hydrocarbons and CO2). Strain localization in faults or shear zones induces dramatic mineralogical, microstructural and geochemical changes in the host rock during syn-deformation fluid-rock interaction. The understanding of these changes is critical to unravel the processes and the pressure-temperature conditions of deformation. We welcome contributions on the role and behavior of both brittle faults and fracture systems and ductile shear zones during fluid/melt circulation in the crust, based both on regional/case studies and/or recent advances in analytical and experimental characterization of fluid phases and microstructures, along with fluid pathway reconstruction and fluid-rock interaction modelling. We encourage contributions from a broad range of scientists with different backgrounds in tectonics, structural geology, numerical modeling, and petrology, with particular emphasis on new and developing tools able to provide insights on processes driving strain localization and fluid/melt-rock interaction controlling faults and shear zones.

Presentazioni orali

42-1 **15.30 - 15.45**
Zullo E.*, Albano M., Saroli M., Moro M., Testa G., Bonora N., Petitta M. & Doglioni C. : Numerical analysis of the post-seismic effects on groundwater flow after the Amatrice-Visso-Norcia 2016 seismic sequence

42-2 **15.45 - 16.00**
Ferrandino V.*, Camanni G., Vinci F., Tavani S., Mazzoli S., Corradetti A., Parente M. & Iannace A. : Controls of fault zone architecture on fault-related fracture density: a case study from shallow-water carbonates of southern Italy

42-3 **16.00 - 16.15**
Remitti F.*, Mittempergher S., Festa A., Cipriani A. & Lugli F. : Mechanical behavior of the shallow part of megathrusts: hints from the Sestola Vidiciatico tectonic Unit (Northern Apennines, Italy)

42-4 **16.15 - 16.30**
[KEYNOTE] Menegon L.*, Michalchuk S., Renard F., Chogani A. & Plumper O. : Fluid flow in deep seismogenic faults

42-5 **16.30 - 16.45**
Casini L.*, Langone A., Oggiano G., Estrada J.R. & Liesa M. : Seismically-induced fluid-fluxed melting of continental crust (N Sardinia, Italy)

42-6 **16.45 - 17.00**
Scambelluri M.*, Pennacchioni G. & Cannaò E. : Eclogitization of the oceanic lithosphere by hydration of brittle structures

42-7 **17.00 - 17.15**
Corvò S.*, Piazolo S., Seno S. & Langone A. : Role of fluids and inherited compositional and structural heterogeneities in shear zone development at mid-low crustal levels: from meso- to micro-scale structural and petrological investigations

42-8 **17.15 - 17.30**
Bickert M.*, Kaczmarek M.A., Maia M. & Brunelli D. : Fluid-assisted deformation processes at the roots of oceanic transform faults: a case study

S.43 Transversal Tectonic Lines in the Apennines: un updated review on their role for Seismicity, magmatism and fluid flow

"Transversal Tectonic Lines" are regional structures almost orthogonal to the axial trend of the Apennines belt. These tectonic lineaments have been well defined during the 60's, mainly on the basis of satellite and aerial photographs. In the recent years several studies were carried out to understanding the role of these structures in constraining the Tertiary and Quaternary tectonic and sedimentary evolution of Apennines and Thyrrenian Basin. In this context, the session promotes a wrap-up and discussion on this theme, aiming at collecting contributions from different approaches, on the: (1) geometric and kinematic reconstruction of the "Transversal Tectonic Lines", with emphasis on their role in controlling the Neogene-Quaternary sedimentary and tectonic evolution of the Thyrrenian Basin and Apennines belt, both in its inner and outer zones; (2) relationships between these structures and

seismicity, along the whole Apennines belt; (3) control exerted on the emplacement of magmatic bodies, circulation of hydrothermal fluids and location of base metal ore deposits..

43-1 **11.00 - 11.15**
Molli G.* : “Stretching Faults” in the inner northern Apennines: a new way to look the problem of LTT’s

43-2 **11.15 - 11.30**
Milia A.* & Torrente M.M. : The 'transverse faults' of the eastern Tyrrhenian margin: places, times and their meanings

43-3 **11.30 - 11.45**
Pizzi A.*, Puliti I., Schettino D., Bonini M. & Calamita F. : The issue of the Olevano-Antrodoco-Sibillini thrust and the Mt.Vettore active normal fault system: barrier or cross-cutting fault? Insights after the 2016 seismic sequence

43-4 **11.45 - 12.00**
Pierantoni P.P.*, Costa M., Teloni S. & Invernizzi C. : Transversal structures on the Outer Marche Apennines: structural characteristics and seismic evidence

43-5 **12.00 - 12.15**
Penza G.*, Pierantoni P.P. & Turco E. : Genesis of the longitudinal extension of the chain and Miocene intra-Apennine basins formation

43-6 **12.15 - 12.30**
Fracassi U.*, Vannoli P., Burrato P. & Valensise G. : What is the origin and the seismogenic potential of the major transverse lineaments that cross the Italian fold-and-thrust belt?

43-7 **12.30 - 12.45**
Taussi M.*, Brogi A., Liotta D., Nisi B., Perrini M., Vaselli O., Zambrano M. & Zucchi M. : CO_2 and steam emissions controlled by enhanced fracture permeability in the Monterotondo Marittimo-Sasso Pisano crustal transfer fault system (Larderello Geothermal Field, Italy)

43-14 **12.45 - 13.00**
Teloni S.*, Valente E., Ascione A., Mazzoli S., Pierantoni P.P., Invernizzi C. : Morphostructural and seismotectonics analysis of the Umbria-Marche Apennines (central Italy): new insight of active tectonics setting using GIS-based morphotectonic investigation

S.44 Faults and shear zones from near the surface to the deep crust: clues from micro-structural analyses, geochronology and geochemistry

Constraining the timing of the tectonic events in complex orogenic belts is of crucial importance for the in-depth understanding of their complex building, evolution and seismicity through space and time. Deformation in the crust, commonly assisted by geofluids, is frequently responsible for the development of complex faults and shear zones at different crustal levels and P-T conditions. By coupling multiscale structural analyses, geochronological dating and geochemical tracers on mylonites, fault rocks, and syn-tectonic/syn-kinematic mineralizations it is possible to reconstruct pressure, temperature, time, composition of the system, fluid origin and fluid-rock interaction associated with complex and long-lasting tectonic (and possibly seismic) events. We aim at providing a forum for all disciplines dealing with and contributing to the better understanding of deformations through space and time. This session welcomes multidisciplinary contributions, including structural geology, petrology, geo- and thermo-chronology, geochemistry and basin analysis, addressing the complex evolution of faults and shear zones both for local and regional tectonic reconstructions..

Presentazioni orali

44-1 **08.30 - 09.00**

[KEYNOTE] Mittempergher S.*, Di Toro G., Bistacchi A., Zanchetta S., Aretusini S., Villa I.M. & Giovanardi T. : Relative and absolute ages of deformative processes at the base of the seismogenic crust from geochronological, microstructural and geochemical studies of the Gole Larghe Fault (Adamello, Italy)

44-2 **09.00 - 09.15**

Langone A.*, Simonetti M., Piazolo S., Bonazzi M., Corvò S. & Maino M. : Dating the shear zone activity at mid to lower continental crustal levels (Ivrea-Verbano Zone, Italy): the power of monazite and titanite

44-3 **09.15 - 09.30**

Zanchetta S.*, Montemagni C., Rocca M., Villa I.M., Morelli C., Mair V. & Zanchi A. : Kinematics and geochronological evolution of the Vinschgau Shear Zone (N Italy): large-scale thrusting within the Austroalpine domain of the central-eastern Alps

44-4 **09.30 - 09.45**

Ceccato A.*, Zappone A.S. & Behr W.M. : Field and remote sensing investigations of deformation structures within the Rotondo granite around the Bedretto Underground Laboratory (Gotthard massif, Central Alps)

44-5 **09.45 - 10.00**
Zuccari C.*, Vignaroli G., Giuntoli F., Novella D., Nestola F., Callegari I., Guillong M. & Viola G. : First documentation of aragonite-bearing HP-LT assemblages within the Precambrian Hajir Fm., Jabal Akhdar Dome, Oman Mountains

44-6 **10.00 - 10.15**
Giuntoli F.*, Viola G. & Eske Sørensen B. : Insights into deep episodic tremors and slip events from High-Pressure continental metasedimentary successions of the Northern Apennines

44-7 **10.15 - 10.30**
Stendardi F.*, Vignaroli G., HsunMing H., Chuan-Chou S. & Viola G. : Multidisciplinary study of the wedge-top Epiligurian Basins as source of inputs to the reconstruction of the deformation history of the Northern Apennines (Italy)

44-8 **11.00 - 11.15**
(Invited) Viola G.*, Musumeci G., Mazzarini F., Tavazzani L., Torgersen E., van der Lelij R. & Aldega L. : Structural characterization and K-Ar illite dating of reactivated, complex and heterogeneous fault zones: Lessons from the Zuccale Fault, Northern Apennines

44-9 **11.15 - 11.30**
Villa I.M.* : Dating deformation: the role of atomic-scale processes

44-10 **11.30 - 11.45**
Zanchi A.*, Locchi S. & Zanchetta S. : Key features for the reconnaissance of synsedimentary extensional faults in the Early Permian Orobic Basin, central Southern Alps (N Italy)

44-11 **11.45 - 12.00**
Locchi S.*, Trumbull R.B., Moroni M., Zanchi A. & Zanchetta S. : Early Permian extensional structures of the central Southern Alps (N Italy), characterized by Boron-rich hydrothermalism

44-12 **12.00 - 12.15**
Rocca M.*, Gasparrini M., Zanchetta S., Berra F. & Zanchi A. : The Jurassic rift-related fault system and its Alpine re-activation history (central Southern Alps, N Italy): clues from structural analysis and paleo-fluid characterization

44-13 **12.15 - 12.30**
Schirripa Spagnolo G.*, Aldega L., Bernasconi S.M., Billi A., Carminati E. & Smeraglia L. : Reconstruction of paleo-fluid flow along the Val d'Agri extensional faults systems (Southern Apennines, Italy)

44-14 **12.30 - 12.45**

Vignaroli G.*, Rossetti F., Petracchini L., Argante V., Bernasconi S.M., Brilli M., Giustini F., Yu T.L., Shen C.-C. & Soligo M. : Tectonic pattern, age, and fluid circulation of the extensional faulting along the active Mount Morrone Fault System (central Apennines, Italy)

44-15 **12.45 - 13.00**

Puliti I.*, Benedetti L., Pizzi A., Fleury J., Guillou V. & Aster Team1 : Slip rates of the Mt.Morrone active normal fault system (Central Apennines) constrained by cosmogenic dating of morphotectonic markers

S.45 Mapping crystalline basements: traditional and innovative approaches

Mapping crystalline basements is difficult due to their polyphased (often transpositive) deformation during the tectono-metamorphic evolution. Furthermore, the emplacement of intrusive bodies and the consequent development of contact aureoles can determine metamorphic processes in the hosting rocks that overprint on previous ones. All those processes affecting metamorphic and magmatic rocks make it difficult for their geometrical reconstruction. For this reason, fieldwork is a basic and unique tool for any kind of investigation which aims to reconstruct the tectono-metamorphic evolution of such settings. A useful approach is the integration of field mapping, also performed with new digital mapping tools (i.e., apps for tablets, digital photogrammetry, 3D modeling), and many other disciplines such as petrology and geochronology. Such an integrative approach contributes to solving issues that cannot be directly resolved from the fieldwork. We welcome contributions based on the geological mapping of metamorphic and igneous rocks overall highlighting (1) how the field mapping can be integrated with information from other disciplines, (2) how new tools can improve data collection and map production, (3) how modern geological maps enhanced the knowledge of complex tectono-metamorphic contexts.

Presentazioni orali

45-1 **17.30 - 17.45**

[KEYNOTE] Spalla M.I.*, Zucali M., Filippi M., Rebay G., Roda M., Zanoni D. & Gosso G. : Integrated structural mapping of crystalline basements: a fundamental tool to unravel mountain building processes

45-2 **17.45 - 18.00**

Carosi R.*, Montomoli C. & Iaccarino S. : Geological and structural mapping 2.0 in metamorphic and basement rocks

45-3 **18.00 - 18.15**

(Invited) Tartarotti P.*, Apuani T., Arrigoni F., Conforto A., Pigazzi E., Tantardini D. & Toffolon G. : Ground-based geological mapping integrated by UASs in the Chiavenna area (Central Alps): examples of application in the frame of the CARG project

45-4 **18.15 - 18.30**
Brogi A.*, Bagnoli G., Capezzuoli E., Liotta D., Lucci F., Molli G., Regoli R., Spina A. & Zucchi M. : The Carboniferous-Permian metamorphic units of Risanguigno Stream (southern Tuscany, Italy)

45-5 **18.30 - 18.45**
Dana D.*, Iaccarino S. & Michard A. : Geological-structural map of the Briançonnais units along the Aiguilles de Chambeyron – Denti di Maniglia Massifs (France, Italy)

45-6 **18.45 - 19.00**
Zanoni D.*, Luoni P., Rebay G. & Spalla M.I. : Tectono-metamorphic map of the Zermatt-Saas Zone ophiolite, Valtournanche, Western Alps

45-7 **19.00 - 19.15**
Musso Piantelli F.*, Truttmann S. & Herwegh M. : Structural-controlled glacial erosion in high erosion-resistance crystalline bedrock

45-8 **19.15 - 19.30**
Vezzoni S.*, Pieruccioni D., Galanti Y., Biagioni C. & Dini A. : A petrographic and geochemical approach to map hydrothermal alteration in polymetamorphic basement (Alpi Apuane)

S.46 From Micro to Macro - How to unravel the nature of the Large Magmatic Events

Large magmatic events (LME) represent the most dangerous natural phenomena occurring on Earth and one of the most intriguing topics for petrologists. They are characterized by very rapid eruptions/intrusions of huge amount of mafic/silicic magmas associated with anomalous mantle and crust partial melting events and/or with peculiar magma storage conditions. LME are constituted by oceanic and continental flood basalts, giant continental dyke swarms, mafic and ultramafic intrusive complexes, silicic large igneous provinces and voluminous and caldera-forming, highly explosive eruptions. Notwithstanding these premises, many aspects related to the processes of genesis, storage in the crust and development of the plumbing system for LME are still far from being clearly understood. The session will address i) the volatiles budget released during eruptions and the percentage originated in the mantle through subduction or that resulting from the interaction with crustal material, particularly with organic matter- or S-rich sediments, ii) the way and time such large volume of magma is generated within the mantle and successively iii) emplaced into the crust and iv) how the plumbing system of these eruptions works. These challenging aspects will be particularly addressed by Micro-scale analytical approaches, key contributions associated with traditional methods (field work and petrological analyses).

Presentazioni orali

46-1 **15.30 - 15.45**
[KEYNOTE] Callegaro S.*, Svensen H.H., Deegan F.M., Jerram D.A., Planke S. & Polozov A.G. : Magma-host rock interaction in basaltic sills from the Siberian Traps (Tunguska basin, Russia): mineral scale and whole-rock perspectives

46-2 **15.45 - 16.00**
Capriolo M.*, Callegaro S., Dal Corso J., Newton R.J., Baker D.R., Renne P.R., Storm M. & Marzoli A. : Synchrotron Light X-ray microtomography data constrain the magma plumbing system of mass extinction-related Large Igneous Provinces

46-17 **16.00 - 16.15**
Guarino V.*, Srivastava R.K. & Melluso L. : Large Igneous Provinces and alkaline magmatism: a review of Early Cretaceous ultramafic-alkaline-carbonatite magmatism intruded in the Shillong Plateau-Mikir Hills massif, NE India

46-25 **16.15 - 16.30**
Velicogna M.*, Boscaini A., Ogunyele A.C., De Min A., Zanetti A., Chiaradia M. & Marzoli A. : Permian post-Variscan mafic dykes of Gallura Region (North Sardinia), a first look

46-13 **16.30 - 16.45**
Cariddi B.*, Costamagna L.G., D'Antonio M., Guarino V., Morra V. & Melluso L. : Adakitic dacites near Siliqua (Southwestern Sardinia): slab melting or arc rock re-melting?

46-6 **16.45 - 17.00**
Mazzucchelli M.*, Bertotto G.W., Conceiçao R.V., Zanetti A., Schilling M.E., Bernardi M.I., Ponce A.D., Jalowitzki T., Gervasoni F. & Cipriani A. : A Poorly Depleted Mantle Source under Southern Payenia as revealed by the Mantle Xenoliths from Huanul Volcano (Central-West Argentina)

46-14 **17.00 - 17.15**
Corvò S.*, Maino M., Piazolo S., Kylander-Clark A.R.C., Seno S.& Langone A. : Dating Triassic-Jurassic rift-related deformation through microstructural and petrochronological analyses: insights on the evolution of a middle continental crustal shear zone (Ivrea-Verbano Zone, Italian Southern Alps)

46-8 **17.15 - 17.30**
Minissale S.*, Casalini M., Cucciniello C., Balagizi C., Tedesco D., Boudoire G., Morra V. & Melluso L. : The geochemistry of recent Nyamulagira and Nyiragongo potassic lavas, Virunga Volcanic Province, and implications on the enrichment processes in the mantle lithosphere of the Tanzania-Congo craton

46-9 **17.30 - 17.45**
Nardini N.*, Casetta F., Ntaflos T., Zanetti A. & Coltorti M. : Evidence of mafic magma replenishment in the feeding systems of the Middle Triassic volcanoes in the Southern Alps

46-10 **17.45 - 18.00**
Mastroianni F.*, Fantozzi I., Petrone C.M., Vougioukalakis G.E., Braschi E., Bragagni A. & Francalanci L. : Unveiling plumbing system dynamics and magmatic processes at the Kolumbo submarine volcano prior to the 1650 C.E. explosive eruption

46-11 **18.00 - 18.15**
Paternostro S.*, Valeriani L., Casalini M., Orlando A., Braschi E., Esposito R., Petrelli M., Avanzinelli R. & Conticelli S. : Sanidine megacrysts from *Monte Amiata*: elemental, Sr-isotope and melt inclusions studies

46-12 **18.15 - 18.30**
Boscaini A.*, Davies J.H.F.L., Sassi R., Mazzoli C., Callegaro S., De Min A. & Marzoli A. : Lifetime of the Early Permian giant caldera-system of Bolzano/Bozen (North-eastern Italy)

46-4 **18.30 - 18.45**
Giovanardi T., da Costa P.C.C., Girardi V.A.V., Weska R.K., Vasconcelos P.M., Thiede D.S., Mazzucchelli M.* & Cipriani A. : The NW Paraná Magmatic Province: Age, geochemistry and mantle source of the Alto Diamantino basalts

46-7 **18.45 - 19.00**
Faccincani L.*, Criniti G., Kurnosov A., Boffa Ballaran T., Withers A.C., Mazzucchelli M. & Nestola F. : Sound velocities and single-crystal elasticity of hydrous Fo90 olivine to 12 GPa

46-15 **19.00 - 19.15**
Ogunyele A.C.*, Giovanardi T., Bonazzi M., Mazzucchelli M., De Carlis A., Cipriani A. & Zanetti A. : Geochemical changes in parental melt sources and metasomatic overprinting of alkali-rich dykes from Ivrea-Verbano Zone, Southern Alps: further evidence from petrography, mineral chemistry and U-Pb zircon geochronology

46-16 **19.15 - 19.30**
Ogunyele A.C. & Bonazzi M.*[1-] : Geochemistry and origin of albite-dominated anorthositic dykes from Ivrea–Verbano Zone, Southern Alps: evidence for ultra-alkaline magmatism at the Gondwana-Laurasia boundary during Late Triassic-Early Jurassic times

S.47 New insights on the study of gem-quality minerals and their synthetic analogous

The session is devoted to updating the most diverse issues in scientific gemmology, including the use of innovative methods of investigation; studies about growth conditions and origin of gem-quality minerals; mineralogical characterization on natural gems and their synthetic homologous; treatments. Moreover, the scientific contributions regarding the trade and the traceability of gem-quality minerals in today's marketplace will be also welcome.

Presentazioni orali

47-1 **11.00 - 11.15**
Precisvalle N.*, Bonadiman C., Langone A., Gigli L., Plaisier J.R., Hansen T.C., Gianoncelli A., Bonanni V., Gariani G. & Martucci A. : Relationship between chemical and structural features of Baoshan topaz to unravel its formation conditions: a multidisciplinary approach

47-2 **11.15 - 11.30**
Coccato A.*, Bersani D. & Caggiani M.C. : Orientational dependence of Raman spectra in gemstones: the case of tanzanite

47-3 **11.30 - 11.45**
Rizzo F.*, Bosi F., Tempesta G. & Agrosì G. : First crystal-chemical characterization of a “watermelon” variety of tourmaline from Anjanabonoina pegmatite (Madagascar)

47-4 **11.45 - 12.00**
Medeghini L.*, Mignardi S., De Vito C., Aurisicchio C., Lottici P.P. & Bersani D. : A non-invasive procedure in the identification of emerald provenance

47-5 **12.00 - 12.15**
Elettivo G.S.*, Agrosì G., Bloise A., Vadrucci M. & Tempesta G. : Preliminary results on e-beam treatment of gem quality Topaz from two different localities

47-6 **12.15 - 12.30**
Costa E.* & Navone R. : Cobalt-diffused beryl

47-7 **12.30 - 12.45**
Idini A.*, Angeli C., Frau F., Ennas G. & Argazzi R. : Bright pink-orange and yellow fluorescence of tsavorite garnet from Merelani Hills, Tanzania

47-8 **12.45 - 13.00**
Caucia F., Scacchetti M.*, Salvioli E., Marinoni L. & Gilio M. : An unusual italian gem: the Datolite of Campotrera (Reggio Emilia, Northern Apennines)

s.48 Resource availability, critical raw materials and by-products for the ecological transition and sustainability

n the midst of the SARS-COV2 epidemics storm, human vessel is navigating between the Scylla of climate change and the Charybdis of the depletion of natural resources, from fossil fuels to mineral commodities. Although both themes are heatedly debated, in our vision, no interpretation of the “sustainability” or the “ecological transition” issues can dodge these predicaments. As a direct consequence of the global economic slump caused by the pandemic, most of the major world’s economical players are reconsidering their grounds and goals. EU has fostered an ambitious project (RRP, Recovery and Resilience Plan) aimed at recovering growth, by further reducing the energy dependence on fossil fuels, already planned after the 2015 COP21 in Paris, and pushing the social and economic activities toward the path of low environmental impact and high energy and material efficiency. These goals could collide against the constraints of the supply of energy and mineral resources whose availability in the near future and in the long term needs to be thoroughly investigated. This session welcomes all kind of contributions either theoretical or experimental, which shed light on problems to be faced and perspectives to be seized, in the future. A non-exhaustive list of topics will include: the future availability of earth and energy resources, prospection of new resources, evolution of exploitation techniques and transformation processes, resources substitution, environmental and health consequences of resources exploitation, recycling of geo-materials, limits and opportunities of urban mining, Anthropocene issues, future development of technologies based on critical raw materials and on renewables.

Presentazioni orali

48-1 **11.00 - 11.30**
[KEYNOTE] Zampieri D.* : Humankind as geological super-agent and the Anthropocene predicament

48-2 **11.30 - 11.45**
Celi L.* : Resource depletion: the EROI issue

48-3 **11.45 - 12.00**
Millacci G.*, Sanginesi F., Giaccherini A., Buccianti A., Fusi L., Pardi L. & Di Benedetto F. : Resource availability and long term sustainability of the energy supply by wind turbines: preliminary results.

48-4 **12.00 - 12.15**

Ardit M.*, Molinari C., Conte S., Zanelli C., Cruciani G. & Dondi M. : Micronization of ceramic colorants. From understanding to energy efficiency of the process

48-5 **12.15 - 12.30**

Ambrosino M.*, Albanese S., Guarino A., De Vivo B., Lima A. & Cicchella D. : New insights on the distribution of Ce, La, Y and Sc in soils combining the compositional data analysis (CODA) and machine learning techniques: the case study of the Campania region

48-6 **12.30 - 12.45**

Perna M.G.*, Zaccaria D., Rosatelli G., Stoppani F.S., Curti E., Spratt J., Humphreys-Williams E., Najorka J., Brownscombe W., Nestola F. & Stoppa F. : Hellandite group minerals from alkali syenite ejecta (Roman Region of Central Italy): mineral chemistry, crystal chemistry structure, genetic conditions, and associations with other REE-mineral phases

48-7 **12.45 - 13.00**

Pagliaro F.*, Lotti P., Comboni D., Fumagalli P., Battiston T., Guastoni A., Rotiroti N. & Gatta G.D. : Effect of the crystal chemistry on the structural and thermo-elastic properties of natural REE-arsenates and phosphates

S.49 Application of cutting edge techniques in global geochemistry: isotopic reservoirs from deep earth, food traceability and CO2 storage

Carbon dioxide removal from the atmosphere is the most ambitious challenge to keep the global temperature increase below the Glasgow COP26 goals and to mitigate climate change; this is a necessary pathway toward a more sustainable future. In the last years, several research projects focused the attention on CO2 storage in different geological settings through either the enhancement of weathering process of mineral and geological formations or the injection of CO2-bearing fluids in the subsurface. The understanding of the geochemical processes occurring when CO2 interacts with the surroundings phases is a necessary step to better evaluating the environmental impact of CO2 storage. This session will welcome contributions related to the reaction between CO2, fluids, rocks and minerals in the subsoil or deep in the sea, including laboratory experiments, thermodynamic models, mobility of major and trace elements, isotope tracers and studies on natural environments. Contributions discussing the impact that these processes may have on the environment are also welcomed.

Presentazioni orali

49-1 **15.30 - 15.45**
Medoro V.*, Ferretti G., Galamini G., Rotondi A., Morrone L., Faccini B. & Coltorti M. : Olives traceability by REE *and trace elements* amount: a statistical approach to determine the geochemical composition from soils and leaves

49-2 **15.45 - 16.00**
Pacifico L.R.*, Guarino A., Brambilla G., Pizzolante A. & Albanese S. : Assessing the transfer factors (TFs) of contaminants from soil to plants: the case study of Campania region (Southern Italy)

49-3 **16.00 - 16.15**
(Invited) Perini M.* & Pianezze S. : Application of stable isotope techniques to detect the authenticity of high value food products

49-4 **16.15 - 16.30**
Ruggiero L.*, Amalfitano C. & Adamo P. : Multielement fingerprinting for traceability of Sorrento and Amalfi PGI lemon juices: the role of non-essential elements at short and large territory scale

49-5 **16.30 - 16.45**
[KEYNOTE] Moreira H.* : Integrating mineral-scale processes into global geochemical changes: a journey into the evolution of the continental crust

49-6 **16.45 - 17.00**
Cannaò E.*, Tiepolo M., Forni F., Sessa G., Greber N.D. & Storck J.-C. : Towards *in-situ* Ti isotope determination in silicates

49-7 **17.00 - 17.15**
Magnani L.*, Farina F., Pezzotta F., Dini A. & Cannaò E. : Investigating prograde metamorphism and pegmatites formation using tourmaline compositional and B isotopes variations. The case of the Adamello Massif (Southern Alps, Italy).

49-8 **17.15 - 17.30**
Pastero L.*, Curetti N., Pazzi M., Bernasconi D., Cotellucci A., Corazzari I. & Pavese A. : Calcium oxalates for mineral carbon capture: a new, green and performing method