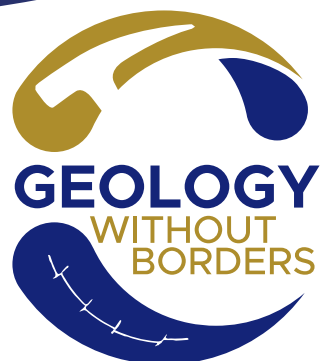




Trieste 14-16 settembre 2021

ABSTRACT BOOK

a cura della Società Geologica Italiana



90° Congresso della Società Geologica Italiana



PRESIDENTS OF THE CONGRESS

Angelo Camerlenghi e Francesco Princivalle

SCIENTIFIC COMMITTEE

Miloš Bavec, Lorenzo Bonini, Marco Brandano, Martina Busetti, Domenico Calcaterra, Alessandro Caporali, Chiara D'Ambrogi, Daniela Di Bucci, Agata di Stefano, Elisabetta Erba, Guido Giordano, Michele Marroni, Silvana Martin, Maurizio Mazzuchelli, Carmelo Monaco, Alberto Montanari, Gian Andrea Pini, Claudia Piromallo, Alina Polonia, Giovanni Pratesi, Luisa Sabato, Mauro Soldati.

ORGANISING COMMITTEE

Erika Barison, Lorenzo Bonini, Martina Busetti, Andrea Caburlotto, Bernardo Carmina, Dario Civile, Florence Colleoni, Carlo Corradini, Federico Da Col, Michela Dal Cin, Laura De Santis, Federica Donda, Paolo Giurco, Giulia Innamorati, Renata Giulia Lucchi, Fabio Massimo Petti, Francesca Petrera, Giorgia Pinna, Michele Rebesco, Umberta Tinivella, Luca Zini, Alessandro Zuccari.

ABSTRACT BOOK EDITORS

Bernardo Carmina, Giulia Innamorati, Fabio Massimo Petti, Alessandro Zuccari.

COVER IMAGE:

Miramare Castle in Trieste (Italy) with mountains in background (Photo 7915319 © Jackallxxx | [Dreamstime.com](https://www.dreamstime.com/)).

*Papers, data, figures, maps and any other material published are covered by the copyright own by the **Società Geologica Italiana**.*

DISCLAIMER: The Società Geologica Italiana, the Editors are not responsible for the ideas, opinions, and contents of the papers published; the authors of each paper are responsible for the ideas opinions and contents published.

La Società Geologica Italiana, i curatori scientifici non sono responsabili delle opinioni espresse e delle affermazioni pubblicate negli articoli: l'autore/i è/sono illi sololi responsabile/i.



A STRATEGY OF TRANSFORMATION

Eni's vision for the future lies in decarbonisation. Energy production plays a key role, requiring great responsibility and attention to climate protection. We have an opportunity to prove that transformation is possible, above all in the energy sector. On a daily basis, Eni is proving its commitment with projects that include increasing the installed capacity of renewable energy, supplying zero emission products, biorefineries to promote sustainable mobility, CO₂ capture and storage and much more. All to reach a destination that has never been closer, on a journey we will make together [...]



Read more on
eni.com

thermo scientific



Illumina il limite della scoperta

La tecnologia che trasforma la tua scienza

Neoma Multicollector ICP-MS

Proprio quando pensavi che non si potesse fare, il nuovo Thermo Scientific™ Neoma™ Multicollector ICP-MS alza l'asticella. Basandosi sulla forza della nostra tecnologia multicollector, questa nuova generazione di strumenti offre tutti i vantaggi dell'analisi dei rapporti isotopici ad alta precisione, ma senza limitazioni. È ora possibile avere informazioni anche dai campioni più piccoli, con una sensibilità impareggiabile, basso rumore di fondo e flessibilità nel passare rapidamente da un'applicazione all'altra. Aggiungi anche i vantaggi del risparmio di tempo con nuovo software e avrai tutto ciò che ti serve per una produttività alle stelle.

Scopri di più su thermofisher.com/neoma

Oppure contattaci: isotopeanalysis-italy@thermofisher.com

© 2021 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries unless otherwise specified. AD30599-EN 0321S

ThermoFisher
SCIENTIFIC



Products and consumables for your laboratory

Nanovision S.r.l. is responsible for the **technical assistance** of the entire line of **Hitachi Electron Microscopes** and is the authorized dealer of the **tabletop and compact Hitachi SEM** in Italy.

Our **catalog** includes accessories related to the world of Electron Microscopy, instrumentation for **samples preparation** and a wide range of **consumables** thanks to our partnership with:

HITACHI
Inspire the Next

Wide array of advanced electron microscopes, including SEM & VP-SEM, FE-SEM, TEM, STEM and Tabletop Microscopes.

TED PELLA, INC.
Microscopy Products for Science and Industry

Microscope products for science and industry such as conductive adhesives, pin stub specimen mounts, pin mount grippers, storage box, calibration specimen for SEM, TEM, AFM and optical microscopes and a lot more for your lab!

quantifoil

Quantifoil® offers special grids for many applications. More than 20 different geometries made of carbon, gold, SiO₂ or plastic on standard mesh or finder grids in different materials available.

Kurt J. Lesker
Company

Leading global provider of high-quality vacuum equipment such as chambers, flanges, fittings, pumps, fluids, valves, traps... They also offer a huge catalogue of deposition material such as pellet, sputtering target and evaporation sources.

NanoMEGAS
Advanced Tools for electron diffraction

Advanced imaging and diffraction tools for Transmission Electron Microscopy.

OXFORD
INSTRUMENTS

Microanalysis systems for electron microscopes (SEM and TEM) and ion-beam systems (FIB).

DEBEN

Motion control and specimen cooling for microscopy application.

point electronic

Software for scanning electron microscopy (SEM and TEM) and related microanalysis application.

SPICER CONSULTING

Magnetic field cancelling systems to protect sensitive equipment in the world's leading laboratories.

Contact us for any enquiry

nanovisio@nanovision.it – www.nanovision.it

INDEX

Plenary sessions	30
Hetényi G. - The added value of frontier-crossing research projects: a few lessons and opportunities	31
Massironi M. - Geological Things from other Worlds	32
Vannucchi P. - Understanding the Earth System through scientific drilling	33
S1. Tectonics and sedimentation	34
Špelić M. & Del Ben A. - Structural setting of the Kvarner area (Northern Adriatic)	35
Atouabat A., Corrado S., Schito A., Mohn G., Haissen F., Leprêtre R. & Frizon de Lamotte D. - The role of structural inheritance in the structuration of the External Rif fold and thrust belt (Rif belt; Northern Morocco) insights from tectono-thermal modeling	36
Barreca G., Gross F., Scarfi L., Aloisi M., Monaco C. & Krastel S. - The Strait of Messina: Seismotectonics and the source of the 1908 earthquake	37
Bertone N., Bonini L., Del Ben A., Brancatelli G., Camerlenghi A., Forlin E., Klaeschen D. & Pini G.A. - Structural inheritance in the Northeastern Mediterranean basin	38
Chizzini N., Artoni A., Torelli L., Polonia A., Basso J. & Gasperini L. - The response of the Apula plate to the advancing Calabrian and Hellenic wedges (Northern Ionian Sea): implications for subduction processes and tectono-stratigraphic evolution	39
Cipriani A. - Tectono-stratigraphic evolution of Jurassic Tethyan rift basins in the Early Cretaceous: a comparison between the Central Apennines and the Southern Alps	40
Corradetti A., Franceschi M., Gregori N., Gianese A., Pillon S., Martinucci D., Pini G.A. & Bonini L. - Solving complex structural geometries using virtual outcrop models: a case study from the frontal sector of the Carso anticline (External Dinarides)	41
Corradino M., Pepe F., Burrato P., Kanari M., Parrino N., Bertotti G., Bosman A., Casalbore D., Ferranti L., Martorelli E., Monaco C., Sacchi M. & Tibor G. - Geometry and kinematics of offshore active faults revealed by an integrated multiscale method	42
Costamagna L.G. & Kustatscher E. - The Buntsandstein of Sardinia (Italy) as keypoint of the Western Tethys paleogeography	43
Frasca G. & Manatschal G. - The importance of Iberia for the kinematic reconstruction of the Mesozoic Alpine Tethys	44

**Seequent
Lyceum 2021**

Partecipa all'evento
gratuito online.
22 Settembre 2021

**Together
Towards
Tomorrow**

SEEQUENT

Le soluzioni software per
geoingegneri e geoscientisti

ADALTA www.adalta.it/Seequent ▶

Gambino S., Barreca G., Gross F., Monaco C., Krastel S. & Gutscher M.-A. - 3D modeling and sequential back-restoration as tools for assessing faults deformation rate in offshore setting and estimation of their seismic potential	45
Invernizzi D., Rozza G., Reguzzi S., Rossi M., Marini M. & Felletti F. - Tectonics and sedimentation interplay in the eastern Tertiary Piedmont Basin (Arquata Scrivia, NW Italy): insights from new seismo-stratigraphic analysis	46
Lanari R., Faccenna C., Benedetti L., Sembroni A., Bellier O., Menichelli I., Primerano P. & Molin P. - Formation and persistence of extensional internally-drained basins: the case of the Fucino basin (Central Apennines, Italy)	47
Locchi S., Zanchi A. & Zanchetta S. - Evidence of syndepositional tectonics during the Early Permian in the Orobic Basin (central Southern Alps, N Italy)	48
Racano S., Cosentino D., Tallini M., Spadi M., Nocentini M. & Schildgen T. - Paleosurface mapping and Quaternary uplift evolution of the Aterno and Tirino Basins	49
Ruocco S., Iacopini D., Tavani S., Ebinger C., Dottore Stagna M., Reynolds D. & Maselli V. - Segmented oblique rift structure in the West Somali Basin, offshore Tanzania as new insight of a Neogene rift tectonic activity	50
Sabbatino M., Tavani S., Vitale S., Corradetti A., Consorti L. & Parente M. - Spatial-temporal migration of the central-southern Apennine belt and foreland basin system (Italy) constrained by Sr-isotope stratigraphy	51
Stendardi F., Vignaroli G. & Viola G. - Unveiling the structural architecture of the wedge-top Epiligurian Units in the Northern Apennines	52
Tomassi A., Trippetta F., De Franco R. & Ruggieri R. - Synthetic seismic forward modeling as a tool to assess the seismic signature of carbonate-bearing fault zones	53
Fantoni R., Bosino A., Cazzini F. & Toscani G. - The Pedalpine Backthrust in the western sector of the Southern Alps	54
Tranos M., Neofotistos P., Kokkalas S. & Tourigny G. - Paleostress analysis and history of the Voltri Unit in the Ligurian Alps (NW Italy) by comparing different stress inversion methods	55
S2. Evolution of sedimentary basins: an integrated approach	56
Abbassi A., Cipollari P., Fellin M.G., Zaghoul M.N., Guillong M., El Mourabet M. & Cosentino D. - The Numidian sandstones of the Molise area (Southern Apennines) in a source-to-sink perspective	57



**Specializzati
nella Trivellazione**

**Pozzi per Acqua - Pali - Geotermia
Sondaggi Ambientali e Geognostici**

Andelković F. - High resolution rift sequence stratigraphy of Badenian sediments near Krčedin (Northern Serbia, Central Paratethys)	58
Bernardi F., Skogby H. & Lenaz D. - Diverse detrital quartz supplies in SE Alps: an FTIR study	59
Berra F., Azmy K. & Della Porta G. - Burial history and diagenesis: stable-isotope and fluid inclusion constraints on the timing of diagenetic events in the dolomitized Dolomia Principale Norian, Southern Alps of Italy)	60
Borrelli M., Avagliano D., Coraggio F., Critelli S. & Perri E. - Relative sea-level variations and basin evolution during the Messinian Salinity Crisis (Crotona and Rossano Basins - North Calabria)	61
Brandano M., Tomassetti L., Di Bella L., Barbieri M., Barberio D. & Ferrini A. - Decoding seafloor and paleoclimate conditions from the paleo-Adriatic domain during early Messinian (Majella, Apennines, Italy)	62
Bruno L., Amorosi A., Demurtas L., Fontana D., Lugli S. & Sammartino I. - Trunk river and tributary interactions and implications for coarse vs fine-grained sediment storage in the Po alluvial basin (northern Italy)	63
Camerlenghi A., Bertoni C., Brancatelli G., Del Ben A., Forlin E., Garcia Castellanos D., Geletti R., Hübscher C., Lofi J., Micallef S., Rebesco M. & Spatola D. - Megaflood deposits in sedimentary basins evolution. The case of the Messinian-Zanclean seismic stratigraphic unit in the Ionian basin	64
Campo B., Amorosi A., Barbieri G., Di Martino A., Scarponi D., Scurti E. & Vaiani S.C. - The Pescara incised valley system: Insights from an onshore sector of the S2S Po-Adriatic sediment routing	65
Cavirani I., Buttinelli M., Mazzarini F., Musumeci G. & Diviaco P. - Tectonic-Sedimentary evolution of the Tuscan shelf: seismic-stratigraphic analysis of Neogenic succession in the norther Tyrrhenian sea (Elba Island - Argentario)	66
Chiarella D. - Fault-controlled deposits: an overview	67
Cipriani A., Caratelli M. & Santantonio M. - Role of Early Jurassic rift architecture in the dispersal of calciturbidites, as revealed by geological mapping in Central and Northern Apennines	68
Civitelli M., Criniti S., Borrelli M. & Critelli S. - Diagenetic destruction of porosity in Quartzofeldspathic sandstones, Miocene Cilento group, Southern Apennines foreland basin system	69
Colleoni F., De Santis L., Pochini E., Forlin E., Geletti R., Brancatelli G., Tesauro M., Buseti M. & Braitenberg C. - PALEOSTRIPv1.0 - a user-friendly 3D backtracking software to reconstruct paleo-bathymetries.....	70
Costamagna L.G. - The Upper Pennsylvanian to Middle Triassic continental succession in SW Sardinia: new key sections, stratigraphic-sedimentological refinements, and petro-sedimentary notes	71

SOFTWARE

- Ingegneria ◀
- Geologia e Geotecnica ◀
- Meccanica delle rocce ◀
- Prove in situ ◀
- Idrologia e Idraulica ◀
- Topografia ◀
- Energia - Geofisica - Ufficio ◀



Falsetta E., Borrelli M., Muto F., Perri E., Tripodi V., Cianflone G. & Critelli S. - Development of a unified geographic database from separated existing data through open-source softwares, Crotona Basin, Southern Italy	72
Gianese A., Franceschi M., Corradetti A., Melis R. & Pini G.A. - Investigations on the emplacement mechanisms of the Eocene olistoliths of the Miramare Castle (Trieste, Italy)	73
Gusmeo T., Corrado S., Schito A., Alania V., Erukidze O., Conventi E. & Cavazza W. - Using multi-proxy thermal maturity datasets to validate deformation styles from the Adjara-Trialeti fold-and-thrust belt to the Greater Caucasus (Georgia)	74
Innamorati G., Fabbi S., Aldega L., Marino M., Pignatti J. & Santantonio M. - Sedimentological and biostratigraphic characterization of the Paludi Formation (Longobucco Basin, north-eastern Calabria): proto-Apenininic shortening of an Alpine foredeep?	75
Kabir S.M.M., Iacopini D., Hartley A., Maselli V. & Oppo D. - Formation, dissolution and fluvial incision of the top evaporite seismic unit (Nahr Menashe) recording the end of the Messinian salinity Crisis, NE offshore Levant Basin, Eastern Mediterranean	76
Limonta M., France-Lanord C., Resentini A., Andò S. & Garzanti E. - Mineralogy and geochemistry of Bengal Fan turbidites (IODP 354): Himalayan provenance and depositional history	77
Longhitano S.G., Chiarella D., Gugliotta M. & Ventra D. - Coarse-grained deltas approaching shallow-water canyon heads: A case study from the Lower Pleistocene Messina Strait, Southern Italy	78
Narduzzi F., Bosch D. & Philippot P. - Nd isotopes support the role of subaerial LIP weathering and continental emergence for the rise of atmospheric O ₂ during the GOE	79
Rebesco M., Camerlenghi A., Munari V., Mosetti R., Ford J., Micallef A. & Facchin L. - Bottom current-controlled Quaternary sedimentation at the foot of the Malta Escarpment (Ionian Basin, Mediterranean).....	80
Rossi V., Bentini M., Cacciari M., Campo B., Sarti G. & Amorosi A. - Late Quaternary glacial-interglacial cycles as revealed by the interfluvial architecture of the Arno palaeovalley (Northern Tuscany, Italy)	81
Rozza G., Invernizzi D., Reguzzi S., Felletti F., Marini M. & Rossi M. - Sedimentological and petrographic evolution of the Oligo-Miocene succession in the Carrosio and Arquata Scrivia area (eastern Tertiary Piedmont Basin, NW Italy)	82
Sorci A., Cirilli S., Ghorbani M., Rettori R. & Spina A. - Facies analysis and depositional environment of a late Cambrian mixed carbonate-siliciclastic ramp from the Arabian Plate (Zagros Basin, Southwestern Iran)	83
Tangari A.C., Andò S., Marinangeli L., Morrone C., Riber L. & Le Pera E. - The Provenance of Modern Sands from Baja California Rivers (Mexico): Petrographic Constraints from Light and Heavy Minerals	84
Tomassetti L., Brandano M. & Mateu-Vicens G. - Facies modelling of proximal environment in the upper Tortonian-lower Messinian carbonate ramp of Hyblean domain (Faro Santa Croce, Sicily, Central Mediterranean)	85
Zurli L., Perotti M., Licht K.J., Mallery C., van de Fliedert T., Marschalek J., McKay R., De Santis L., Kulhanek D.K., Cornamusini G., Patterson M., De Sousa I. & IODP Expedition Scientists - Petrology and distribution of the Miocene-Pliocene gravel size clasts from IODP_exp374 Site U1522 drillcore in the Ross Sea (Antarctica)	86
Berra F., Calabrò R.A. & Perotti C.R. - Architecture of fault-controlled Norian intraplateau basins (Southern Alps, Italy): geometry and possible mechanisms of a rift cluster	87
Crittelli S. & Critelli S. - Detrital modes of Permian sandstones in southern Italy	88
Wang L., Maestrelli D., Corti G., Zou Y. & Shen C. - Reactivation or non-reactivation? Analogue models of multiphase rifting and applications to the Turkana depression, East Africa	89
S3. Oceanic lithosphere and subduction factory	90
Aretusini S., Spagnuolo E., Meneghini F., Vannucchi P., Murphy S., Harbord C. & Di Toro G. - High velocity friction experiments on IODP materials: insights on earthquake propagation in the subduction zone	91
Barbero E., Pandolfi L., Delavari M., Dolati A., Saccani E., Catanzariti R., Luciani V., Chiari M. & Marroni M. - The western Durkan Complex (Makran Accretionary Prism, SE Iran): A Late Cretaceous tectonically disrupted seamounts chain and its role in controlling deformation style	92

Caso F., Ferrando S., Mosca P., Zucali M. - Structural and metamorphic evolution of the Rocca Canavese Thrust Sheet Unit (Sesia-Lanzo Zone, Western Alps, Italy)	93
Cannaò E., Tiepolo M., Farina F., Sessa G., Ferrari E., Agostini S. & Scambelluri M. - In situ boron isotopes in ophicarbonates: implications for the B and C cycles in subduction zones	94
Federico L. & Crispini L. - Oblique exhumation of HP rocks at the southern tip of the Western Alps: a review	95
Ferrari E., Secchiari A., Montanini A. & Cluzel D. - The Bogota pyroxenites (New Caledonia): new insights on mantle heterogeneity in young subduction systems	96
Ghiotto M., Natali C., Bragagni A., Braschi E., Avanzinelli R., Casalini M., Ghafaribijar S., Arvin M. & Conticelli S. - The Lar alkaline igneous complex: genesis and geochemical features of a subduction-related magmatic event in the Sistan belt (SE Iran)	97
Giuntoli F. & Viola G. - Brittle-ductile deformation in high-pressure continental units and deep episodic tremors and slip events	98
Mariani D., Ferrando C., France L. & Tribuzio R. - Granoblastic dikes in the lower oceanic crust exposed at Atlantis Bank (Southwest Indian Ridge)	99
Remitti F., Mitterpergher S., Arletti R., Polisi M., Festa A., Tesi T. & Aretusini S. - Impact of compositional variability of pelagic clay-rich sediments on the mechanical behavior of accretionary prism	100
Bloise A., Punturo R. & Ricchiuti C. - Hydrothermal alteration of ultramafic xenoliths from Miocene tuff breccias from Valle Guffari (southern Sicily, Italy): results from laboratory tests	101
Rizzo G., Buccione R., Paternoster M., Laurita S., Bloise L., Calabrese E., Sinisi R. & Mongelli G. - Geochemistry and petrology of plagiogranites in the ophiolites from the Pollino Massif (Southern Italy): Origin and tectonic significance	102
S4. Exhumation processes	103
Almazán-López M.M., Colás V., Ortega-Gutiérrez F. & Elías-Herrera M. - Exhumation of the HP eclogites from the Acatlán Complex (south Mexico): new insights from retrogressive microstructures	104
Bonazzi M., Langone A., Corvò S., Maino M. & Nazzari M. - Titanite from metacarbonates: a (unique) petrological and geochronological tool. An example from the Valle Strona di Omegna (Ivrea-Verbano Zone, Western Alps, Italy)	105
Corvò S., Maino M., Langone A. & Piazzolo S. - Microstructural and petrological characterization of a major extensional shear zone in the middle crust (Val d'Ossola, Ivrea-Verbano Zone, Western Alps)	106
Corvò S., Maino M., Langone A., Schenker F.L., Casini L., Piazzolo S. & Seno S. - Local variations of metamorphic record from compositionally heterogeneous rocks: Inferences on exhumation processes of HP rocks from the Adula-Cima Lunga unit	107
Filippi M., Spalla M.I., Pigazzini N., Diella V., Lardeaux J.M. & Zanoni D. - Chloritoid-staurolite-andalusite-bearing assemblages in the Central Southalpine basement as markers of evolving thermal regime during Variscan convergence and exhumation	108
Modesti A., Gosio F., Martin S., Nimis P. & Tartarotti P. - New evidence of high-pressure metamorphism in an ophiolite sequence in the Upper Soana valley, Western Alps	109
Montemagni C. & Zanchetta S. - Kinematics and geochronology of the Simplon Shear Zone extensional detachment in the Western Alps	110
Petroccia A., Carosi R., Montomoli C., Iaccarino S. & Vitale Brovarone A. - Structural, kinematic, and thermal constraints on shear deformation in the Barbagia Thrust (Nappe Zone, Sardinia, Italy)	111
Regorda A., Spalla M.I., Roda M., Lardeaux J.M. & Marotta A.M. - Metamorphic P-T conditions characteristic of subduction/collision systems: insights from 2D numerical models	112
Russo D., Fiannacca P., Fazio E. & Cirrincione R. - Twenty million years of supra- to sub-solidus deformation during exhumation of middle crust from the South-European Variscan Belt (Peloritani Mountains, NE Sicily)	113
Simonetti M., Langone A., Corvò S., Bonazzi M. & Maino M. - Rift-related deformation in the lower continental crust: new insights from the multidisciplinary study of the Forno-Rosarolo shear zone (Ivrea-Verbano Zone, Western Alps)	114

Ortolano G., D'Agostino A., Fiannacca P., Rebay G., Visalli R. & Cirrincione R. - X-ray quantitative image analyses of progressive symplectite formation during granulite/amphibolite facies retrogression.....	115
S5. Adria Plate	116
Anderlini L., Serpelloni E., Devoti R., Palano M., Sparacino F. & Pezzo G. - Active shortening across the Northern Apennines-Adria fault boundary from continuous offshore GNSS stations	117
Aoudia A., Foundotos L., Wang H., Vičić B. & Foroutan M. - Mechanics of the Raša fault and earthquake hazard on the city of Trieste	118
Areggi G., Merryman Boncori J.P., Anderlini L., Magrin A., Pezzo G., Rossi G., Serpelloni E., Tunini L., Zuliani D. & Bonini L. - Displacement rate measurement in Northeastern Italy by using PS-InSAR and GNSS data	119
Atanackov J., Jamšek Rupnik P., Bavec M., Jež J., Celarc B., Novak A., Novak M. & Kastelic V. - Cross-border challenges in active fault definitions across the Slovenia-Italy border	120
Bou-Rabee D.M., Vičić B., Lechleitner F., Aoudia A., Henderson G. & Sebelja S. - Records of paleoearthquakes in speleothems in the Northwestern Dinarides, Slovenia	121
Cicala M., Festa V., Sabato L., Tropeano M. & Doglioni C. - Interference between Apennines and Hellenides foreland basins around the Apulian swell (Italy and Greece)	122
Dal Cin M., Busetti M., Böhm G., Picotti S., Zgur F. & Camerlenghi A. - New insights into the northeastern edge of Adria plate (Gulf of Trieste) by 3D velocity-depth models from reflection tomography and depth imaging of multichannel seismic data	123
Fantoni R. - From Mesozoic extension to Cenozoic compression in Po Plain and Adriatic Sea	124
Fiorentino A., Battaglini L., D'Angelo S., Pantaloni M. & Pappasodaro F. - Harmonization of geological data in the Adriatic Sea	125
Lanzoni A., Del Ben A., Forlin E., Donda F. & Zecchin M. - The Messinian Salinity Crisis in the Adriatic Sea	126
Magrin A. & Rossi G. - Deriving a new crustal model of Northern Adria: the Northern Adria Crust (NAC) model	127
Milano M., Kelemework Y., Iorio M. & Fedi M. - Modeling of crustal and thermal structures from magnetic field data: the case of Adria Plate	128
Molinari I. & Handy M.R. - Understanding the European and the Adriatic plates from the top down	129
Patricelli G., Poli M.E., Paiero G., Zanferrari A., Marchesini A. & Monegato G. - New evidence of recent tectonic activity of the Susans-Tricesimo thrust-system (NE Italy)	130
Rossi G., Pastorutti A., Nagy I., Braitenberg C. & Parolai S. - Evidence of fault-valve behaviors at the northern edge of the Adria microplate	131
Zampieri D., Vannoli P. & Burrato P. - Role of the long-lived Schio-Vicenza Fault System at the northern Adria plate margin	132
S6. Coupling deep mantle structures with surface processes and magmatism along the Tethyan margin	133
Ballato P., Licht A., Huntington K.W., Schauer A.J., Mulch A., Heidarzadeh G., Paknia M., Hassanzadeh J., Mattei M., Ghassemi M. & Strecker M. - Constraints on the Timing of Surface Uplift of the Iranian Plateau (Arabia-Eurasian Collision Zone) from Clumped Isotope Thermometry on Pedogenic Carbonates	134
Chiarabba C., Menichelli I. & De Gori P. - A look at the deep structure and dynamic of the circum-Mediterranean orogens	135
Clementucci R., Ballato P., Siame L., Fox M., Sembroni A., Yaaqoub A., Lanari R., Faccenna C. & Essaifi A. - Rejuvenation of a tectonically inactive mountain belt: insights from the Anti-Atlas (Morocco)....	136
Magni V., Prada M., Naliboff J. & Gaina C. - Ridge jumps and mantle exhumation in the Tyrrhenian back-arc basin	137
Molin P., Sembroni A., Faccenna C. & Ballato P. - The uplift of a collisional plateau unraveled by river network analysis: the case of the Eastern Anatolian Plateau	138

Narduzzi F., Ponton M., Marelllo M., Castro M-P., Queiroga G., Lana C., Zibera L. & De Min A. - Characterization of 70 Ma-old minette dykes from the Julian Alps, NE Italy	139
Pastorutti A., Braitenberg C., Pivetta T. & Tesauro M. - Flexural rigidity and isostatic residuals across the Zagros Orogen and the Urumieh-Dokhtar magmatic belt from cross-spectral analysis of topography, gravity, and crustal models	140
Rabiee A., Rossetti F., Lucci F. & Lustrino M. - A petrotectonic model for the Cenozoic porphyry/epithermal mineralizations along the Iranian tectono-magmatic belt	141
Racano S., Schildgen T. & Cosentino D. - Landscape evolution and plate boundary processes: the study case of the Central Anatolian Plateau margins	142
Relvini A., Prosser G., Martin S., Bartoli O. & Carvalho B. - Cenozoic subduction in the Central Alps and the intrusion of the Adamello batholith	143
Scarponi M., Hetényi G. & IvreaArray Team - New constraints on the Ivrea Geophysical Body at intra-crustal scales: a combination of gravimetry with passive seismology and rock's physical properties	144
Tinagli L., Dini A., Vezzoni S. & Rocchi S. - Granitoids and pyrite bodies exploited similar crustal traps in the Gavorrano Intrusive-Hydrothermal Complex (Tuscany)	145
Todrani A., Speranza F. & D'Agostino N. - Evolution of the Tibet-Indochina orogenic system since 60 Ma: from NE India corner indentation to collapse and eastward flow of Tibet crust	146
Boutoux A., Briaud A., Faccenna C., Ballato P., Rossetti F. & Blanc E. - Slab folding and surface deformation in the Iran mobile belt Slab folding and surface deformation in the Iran mobile belt	147
S7. Dynamics of the Earth interior	148
Ahmadi H. & Uyguegil H. - Targeting iron prospective within the Kabul Block (eastern Afghanistan) via hydrothermal alteration mapping using remote sensing techniques	149
Bollino A., Marotta A.M., Restelli F., Regorda A. & Sabadini R. - New insights on the dynamics of the Sumatra and Mariana complexes inferred from the comparative analysis of gravity data and model predictions	150
D'Agostino A., Ortolano G., Visalli R., Zucali M. & Cirrincione R. - X-Min Learn: a supervised machine learning approach to perform automatic mineral classification from X-ray maps	151
Gerya T.V., Bercovici D. & Becker T.W. - Brittle-ductile damage and segmentation of subducting oceanic plates	152
La Fortezza M. & Belmonte D. - Towards an ab initio physically-consistent thermodynamic database for deep mantle phases: the case of Mg ₂ SiO ₄ ringwoodite	153
Lo Bue R., Faccenda M. & Yang J. - Geodynamic and seismological modelling of the recent dynamics of the Central Mediterranean region	154
Manu-Marfo D. & Aoudia A. - Crust-uppermost mantle structure and buoyancy driven flow model beneath the Tyrrhenian basin undermines regional extension and slab retreat	155
Miglio E. - Physics-Informed-Neural-Network in Geodynamics	156
Milia A. & Torrente M.M. - Propagating triangular rifts of the Tyrrhenian Sea	157
Miozzi F., Morard G., Antonangeli D., Clark A.N., Baron M.A., Pakhomova A., Mezouar M. & Fiquet G. - The Fe-Si-C system at extreme conditions: a combined mineralogical and petrological approach to the study of deep planetary interiors	158
Muluneh A., Brune S., Illsley-Kemp F., Corti G., Keir G., Glerum A., Kidane T. & Mori J. - Geodynamic modelling of lithospheric extension constrained the mechanism for deep crustal earthquakes in the Main Ethiopian Rift	159
Natale Castillo M.A., Tesauro M. & Cacace M. - Rocks' Rheology and Seismic Attenuation: What do we know?	160
Paiva Muller V.A., Sternai P. & Sue C. - The role of the asthenospheric window and deglaciation on the present-day uplift of the southern Patagonian Andes	161
Palmiotto C., Ficini E., Loreto M.F., Muccini F. & Cuffaro M. - Back-arc spreading centers and superfast subductions: the case of the Northern Lau Basin (Pacific Ocean)	162

Paternostro S., Valeriani L., Braschi E., Orlando A., Francalanci L., Cioni R., Casalini M., Avanzinelli R. & Conticelli S. - Polybaric crystallisation and equilibrium conditions of Mount Amiata volcanic rocks, and their significance in the frame of magma evolution: insight from igneous mineral chemistry and microtexture petrography	163
Piccolo A., Kaus B.J.P., Palin R.M. & White R.W. - The origin of the oldest terrestrial felsic terranes: how geodynamic and petrological forward modelling assists the discovery of the deep past	164
Pistone M., Ziberna L., Hetényi G., Scarponi M., Zanetti A. & Müntener O. - Joint Geophysical-Petrological Modeling on the Ivrea Geophysical Body Beneath Valsesia, Italy: Constraints on the Continental Lower Crust	165
Rappisi F., Vanderbeek B.P. & Faccenda M. - Teleseismic Anisotropic P-wave tomography of the Central Mediterranean	166
Sadeghi-Bagherabadi A., Margheriti L., Aoudia A. & Sobouti F. - Seismic Anisotropy and Its Geodynamic Implications in Iran	167
Sadeghi-Bagherabadi A., Vuan A., Aoudia A., Parolai S. & The AlpArray and Alp Array-Swath-D Working Group - High-Resolution Crustal S-wave Velocity Model, the Crystalline Basement Depth and Moho Geometry Beneath the Southeastern Alps, the Western Part of the External Dinarides, and the Friuli and Venetian Plains	168
Thapa H.R., Aoudia A., Pachhai S. & Manu-Marfo D. - Crustal structure and discontinuities beneath the Nepal Himalaya using seismic ambient noise and teleseismic P wave coda autocorrelation	169
Venier M., Ziberna L., Mancini L., Kao A.P., Bernardini F., Roncoroni G., Youbi N., Majigsuren Y., Lenaz D. & De Min A. - A comparative study between X-ray computed microtomography and thin sections observation of mantle xenoliths	170
Maddaloni F., Pivetta T. & Braitenberg C. - The traces of magmatic pulses in the crustal density structure of the Western African Rift System	171
Maddaloni F., Tesauro M., Delvaux D., Gerya T. & Braitenberg C. - What does it link the surface to the deep Earth's processes? The tectonic evolution of the Congo basin: an example of intracratonic basin	172
S8. Impact of Renewable and Geo-Energies	173
Barison E., Mattera S., Donda F., Tinivella U., Merson B., Reveillere A., Vincent C., Vellico M. & Volpi V. - Identification of sites potentially suitable for hydrogen storage in Italy	174
Briganti A., Voltaggio M., Tuccimei P. & Soligo M. - Using ²²² Radon as tracer for areal and vertical distribution of hydrocarbon contaminations	175
Caselle C., Bonetto S., Ramon A., Costanzo D. & Alonso E. - Effect of material heterogeneity and environmental humidity on the stability of gypsum in underground quarries	176
Chiarella D., Payton R.L. & Kingdon A. - Using digital pore-scale image analysis to assess subsurface carbon storage reservoir potentiality	177
Conte A.M., Guglietta D., Marrocchino E., Soro G. & Vaccaro C. - Recycling of granite scraps in Sardinia by innovative and economically-viable extraction technology in a context of circular economy	178
Maggini M., Taussi M. & Renzulli A. - Defining the shallow geothermal potential by using the seismic microzonation data: a case study from the Southern Marche Region to encourage a sustainable post 2016-earthquake reconstruction	179
Morelli A. - Status and perspectives of monitoring induced seismicity in Italy	180
Rman N., Lapanje A., Atanackov J., Šram D., Rajver D., Maros G., Kun É. & Marković T. - Geomanifestations in the Pannonian basin as an indicator of deep structures and geothermal potential	181
Somma R., Blessent D., Raymond J., Constance M., Cotton L., De Natale G., Fedele A., Jurado M.J., Marcia K., Miranda M., Troise C. & Wiersberg T. - A comparison of three recent drilling projects in unconventional geothermal resources in the Phlegraean Fields Caldera, the Cornubian Batholith, and the Williston Sedimentary Basin	182
Facci M., Gola G., Di Sipio E. & Galgaro A. - Energy transition and reuse of oil and gas wells as deep enhanced closed loop geothermal heat exchangers: the Padova area (Italy) case study	183

S9. Hydrogeological environments: challenges and advances	184
Avataneo C., Belluso E., Capella S., Lasagna M. & De Luca D.A. - Groundwater asbestos contamination in Naturally Occurring Asbestos (NOA) rich areas: a study on fibres characteristics, concentration and their possible mobility in aquifers	185
Cogo E., Quaranta N. & Frulla D. - An adaptation plan for the salt water intrusion into the coastal aquifer of Fano (PU, IT): management of risk in sea level rise scenarios (EU Interreg Asteris Project)	186
Cuiuli E. - Preliminary hydrogeological study of the Rosarno Plain in the sector between Nicotera and Gioia Tauro (Calabria - Southern Italy)	187
Cuiuli E. - Hydrogeological setting of the multilayer aquifer of S. Eufemia Lamezia Plain (Calabria)	188
Ducci D. & Rusi S. - A multidisciplinary approach to outline natural and anthropogenic groundwater contamination (case studies in central and southern Italy)	189
Egidio E., Lasagna M., Mancini S. & De Luca D.A. - The impact of climate change on groundwater temperature of the Piedmont Po plain (NW Italy): preliminary results	190
Fronzi D., Mammoliti E., Palpacelli S., Marcellini M., Gaiolini M., Domizi J., Colombani N. & Tazioli A. - Hydrogeological map of the Southern mountainous portion of Marche Region (Central Italy)	191
Karlicek D., Zini L., Terribili L., Calligaris C., Finocchiaro F., Pavoni E. & Dreossi G. - Geochemical characterization of the Timau Karst aquifer	192
Lentini A., Meddi E., Galve J.P., La Vigna F. & Papiccio C. - Identifying areas suitable for Sustainable Drainage Systems and Aquifer Storage and Recovery to mitigate stormwater flooding phenomena in Rome (Italy)	193
Mancini S., Lasagna M., Egidio E., Lasagna M. & De Luca D.A. - Application of different statistical methods for analysis of groundwater levels in time: spatio-temporal analysis in Piedmont plain (NW Italy) and comparisons with rainfall time series	194
Salvadori M., Frollini E., Ghergo S., Masciale R., Parrone D., Passarella G., Preziosi E. & Pennisi M. - A multi-isotope (O, H, B, Sr) approach for identifying salinity contamination along the coastal sector of Murgia aquifer (Apulia, Southern Italy).....	195
Sanna L. - Flash flood event recorded in caves: the case of Supramonte (Sardinia, Italy)	196
Santillán L., Bravo C. & Caicedo J. - Evaluation of the SWAT model with respect to different variables within the Tomebamba River sub-basin belonging to the Paute River Basin-Ecuador	197
Bonetto S.M.R. & Caselle C. - Karst morphologies and related risks in gypsum of Monferrato area (NW Italy).....	198
Busetti A., Calligaris C., Turpaud P. & Zini L. - Groundwater sustainability of the Isonzo aquifer	199
Calligaris C., Finocchiaro F., Manca P., Ponton M., Potleca M. & Zini L. - Tracing test in caves of Mt. Bernadia: in search of subterranean watershed	200
Cuiuli E. & Procopio S. - Methodological study of aquifers based on integrated use, of the hydrogeological survey, radiometric analysis and field-type parametric measurements	201
Piccini L. & Nannoni A. - Monitoring karst aquifers hydrodynamics in metamorphic carbonates: the example of the Apuan Alps, Italy	202
Telloli C., Di Renzo D., Rizzo A., Salvi S., Marrocchino E. & Vaccaro C. - Electrolytic enrichment method for the determination of tritium in aquifers: tritium as an indicator of anthropogenic pollution	203
S10. Earthquakes and Tsunami	204
Armigliato A., Angeli C., Gallotti G., Pagnoni G., Tinti S., Zanetti M. & Zaniboni F. - Historical impact and hazard assessment for tsunamis along the eastern Sicily coasts: a review	205
Bello S., Andrenacci C., Cirillo D., Scott C.P., Brozzetti F., Arrowsmith J.R. & Lavecchia G. - High detail fault segmentation: deep insight into the anatomy of the 1983 Borah Peak earthquake rupture zone (M_w 6.9, Idaho, USA)	206
Carboni F., Porreca M., Valerio E., Manzo M., De Luca C., Azzaro S., Ercoli M., Barchi M.R. & Lanari R. - Complex deformation pattern of the October 2016 central Italy earthquakes from DInSAR data	207

Castillo Ramos L.A., Argueta Platero A.A., Mercurio C., Vessia G., Conoscenti C. & Rainone M.L. - Preliminary results from 1D simulation of the seismic response analyses at San Salvador Urban Center.....	208
Di Toro G., Aretusini S., Cornelio C., Nielsen S. & Spagnuolo E. - Friction during earthquakes: 25 years of experimental studies	209
Monaco C., Barreca G., Bruno V., De Guidi G., Ferlito C., Gambino S., Gross F., Mattia M. & Scarfi L. - The Timpe fault system (Mt. Etna, Sicily): a seismogenic releasing bend along the Alfeo-Etna shear zone	210
Parrino N., Srivastava E., Burrato P., Malik J. & Pepe F. - Morphotectonic evidences of elusive active faults in a low strain rate region: clues from the eastern Kachchh region (NW India)	211
Petracchini L., Buttinelli M., Maesano F.E., D'Ambrogi C., Scrocca D., Marino M., Capotorti F., Bigi S., Cavinato G.P., Mariucci M.T., Montone P. & Di Bucci D. - The role of inherited structures in the 2016-2017 Central Italy seismic sequence: lessons learned in the framework of the RETRACE-3D project	212
Pirrotta C., Barbano M.S., Barberi G., Barreca G., Carnemolla F., De Guidi G., Monaco C., Parrino N., Pepe F. & Scarfi L. - Morphotectonic, geodetic and seismic analyses to define activity and kinematics of the bounding-faults of the Catanzaro Trough	213
Poli M.E., Paiero G., Patricelli G. & Marchesini A. - Historical tectonic activity of the Valdobbiadene-Vittorio Veneto thrust (NE Italy)	214
Poli M.E., Bonini L., Busetti M., Piano C., Marchesini A., Civile D., Dal Cin M., Paiero G., Patricelli G., Ponton M., Areggi G., Bensi S., Bertone N., Del Ben A., Massari G., Pini G.A., Rebez A., Santulin M., Tamaro A., Zampa L.S. & Zanferrari A. - Database of active faults in Friuli Venezia Giulia: a basic tool for seismic hazard assessment	215
Ponte M., Chiappetta G.D. & La Rocca M. - Seismotectonic analysis of the north-east sector of Calabrian Arc	216
Puliti I., Pizzi A., Gori S., Falcucci E., Galadini F., Maceroni D., Moro M. & Saroli M. - New paleoseismological constraints of late Holocene earthquakes along the Mt. Morrone fault (Sulmona basin, Abruzzi Apennines, Italy)	217
Teloni S., Valente E., Ascione A., Mazzoli S. & Invernizzi C. - Morphostructural evidence of active tectonics in the Umbria-Marche Apennines, central Italy	218
Salic R., Milutinovic Z., Tomic D., Trajceviski J., Dimitrovski M. & Neziri Z. - Seismic hazard zonation and seismic design codes. A regional perspective.	219
S11. Volcanic Hazard in the terrestrial and marine environment.....	220
Borzi A.M., Palano M. & Viccaro M. - A combined analysis of geodetic and geochemistry data during the period January 1994-December 2018	221
Casalbore D., Di Traglia F., Bosman A., Romagnoli C., Casagli N. & Chiocci F.L. - Morphological changes during the 2014 effusive eruption at Stromboli through the integration of subaerial and submarine data.....	222
De Guidi G., Cannavò F., Carnemolla F., Brighenti F., Menichetti M., Roccheggiani M., Figlioli A., Giuffrida S., Russo D. & Monaco M. - Slipping on the faults of east flank of Mont Etna during December 2018 volcanic unrest. Results and numerical modelling of UNICT_NET GNSS Network monitoring and Sentinel-1 SAR interferometry	223
Di Martino R.M.R., Gurrieri S., Diliberto I.S., Vita F., Camarda M., Francofonte V. & Italiano F. - Design and implementation of the gas hazard early warning system at Vulcano - Aeolian Islands	224
Fiorentino A., Battaglini L. & D'Angelo S. - Volcanic and non-volcanic fluid emissions: data from EMODnet Geology	225
Gabellini P., Lacanna G., Ripepe M., Cioni R., Hantusch M., Montenegro V., Valderrama O., Farias C. & Caselli A. - Mechanisms of ash production and recycling during low-energy, mid-intensity eruptions at Copahue volcano (Argentina)	226
Grezio A., Costa A., Paris R., Sandri L., Selva J., Tierz P., Tonini R. & Ulvrova M. - State of knowledge about tsunami hazard due to volcanic sources in the Gulf of Naples	227
Massaro S., Sandri L., Selva J., Costa A., Martinez B., Sulpizio R., Giaccio B., Moscatelli M., Nocentini M., Peronace E. & Isaia R. - Assessing long-term tephra fallout hazard from Neapolitan volcanoes on Southern Italy	228

Messina M., Floridia G. & Viccaro M. - Statistical and probabilistic GIS-based approach for the assessing of the hazard by lava flow invasion at Mount Etna volcano (Sicily, Italy)	229
Pistolesi M., Rosi M., Bertagnini A., Di Roberto A., Renzulli A., Voloschina M. & Ripepe M. - Eruptive activity and tsunamigenic landslides at Stromboli volcano (Italy): clues from deposits and future perspectives	230
Pucciarelli G. - Seismic Tomography of Southern Tyrrhenian by means of teleseismic data	231
Valade S. - Volcanic hazard monitoring from space using MOUNTS	232
Zuccarello F., Chiara T., Giuffrida M., Cannata A. & Viccaro M. - The exceptional 2020-2021 paroxysmal activity at Mt. Etna: insights on the pre-eruptive magma dynamics by combining geochemical and geophysical data	233
Zuccarello F., Schiavi F. & Viccaro M. - Dehydration induced by magma ascent velocity and hazard implications for explosive eruptions at Mt. Etna volcano	234
S12. Landslides in the terrestrial and marine environment	235
Argueta Platero A.A., Castillo Ramos L.A., Mercurio C., Vessia G., Rainone M.L. & Conoscenti C. - Development of a methodology for the characterization and monitoring of landslides using UAV (Unmanned Aerial Systems) techniques: A case study of a debris flow in Nejapa (El Salvador)	236
Bosino A., Bettoni M., Omran A., Bernini A., Simoncelli L., Adeniyi O.D. & Maerker M. - Assessment of Badland area variations for two study sites in the Northern Apennines (Italy)	237
Brunetti M.T., Denti B., Peruccacci S., Melillo M., Gariano S.L., Rossi M., Marchesini I., Loddo S., Cinus S. & Caracciolo D. - Rainfall thresholds for landslide early warning system in Sardinia	238
Cardia S., Palma B. & Parise M. - The Iterative Pole Density Estimation, a new approach to assessing the stability of rock masses from 3D point clouds	239
Casalbore D., Bosman A., Martorelli E. & Chiocci F.L. - Variability of submarine landslides along the Pontine Islands and intra-slope Palmarola ridge	240
Chelli A. & Leonelli G. - Dating landslide movements at the Carobbio study site, Northern Apennines	241
Coco L., Macrini D. & Buccolini M. - Landslide Susceptibility Mapping by comparing simple GIS-based bivariate methods: the importance of geomorphological dimension beyond the statistics	242
Innocentini S., Quartau R., Casalbore D., Roque C., Vinhas A. & Rodrigues A. - Small-scale instability processes affecting volcanic island shelves: the case study of the southern shelf of Porto Santo Island (Madeira Archipelago)	243
Marzini L., Amaddii M., Papasidero M.P., D'Addario E., Disperati L. & Chianucci F. - Influences of vegetation characters on saturated hydraulic conductivity at catchment scale	244
Meo A., Budillon F., Senatore M.R. - The Taranto Landslide (North Ionian Sea): further morphological and stratigraphical observations and timing of the event by indirect stratigraphic evidences	245
Mureddu A. - Civil protection interventions - OCDPC n. 558 of 15.11.2018 - Functional recovery of the Provincial Road No. 20 - Municipality of Castiadas (Sardinia)	246
Mureddu A. - Civil protection interventions - OCDPC n. 558 of 15.11.2018 - Restoration and functional recovery of Provincial Road No. 97 - Municipalities of Castiadas and Muravera	247
Rovere M. & Gauchery T. - Submarine landslides in the Strait of Sicily: relation with tectonics and climate forcing, contourite deposits and high sedimentation rates, post-LGM sea-level fluctuations	248
Ruberti D., Marino E. & Vigliotti M. - Integration of geological surveys and remote sensing to assess the sea-cliff stability of a tuff headland in a pocket beach (Ventotene Island, Southern Italy)	249
Salvati P., Bianchi C., Guzzetti F. & Rossi M. - Conditions and behaviours influencing people vulnerability to landslides	250
Vennari C., Salvati P., Marchesini I., Basso A. & Casarano D. - Apulian landslides in the last decade	251
Borrelli L., Conforti M., Mercuri M. & Muto F. - UAV photogrammetry-based remote sensing for assessing the short-time evolution of a large earthflow in southern Apennines of Italy	252
Calligaris C., Busetti A., Piano C. & Zini L. - Natural sinkhole hazard in the Friuli Venezia Giulia Region ...	253
Calligaris C., Forte E., Busetti A., Liuzzi F. & Zini L. - Is it a landslide or a sinkhole?	254

S13. Floods	255
Amaddii M. & Paolucci E. - Estimation of the unconsolidated material-bedrock shallow interface depth by HVSR and MASW seismic survey for rainfall-runoff modelling	256
Brenna A., Marchi L., Borgia M., Ghinassi M., Zaramella M. & Surian N. - Debris floods in mountain streams: Insights from the Vaia Storm (October 2018) in the Tegnass catchment (Dolomites, Italy)	257
Mandarino A. - (In)active channel and floodplain geomorphic response to the autumn 2019 high-magnitude floods in the Orba River (NW Italy)	258
Scorpio V. - Geomorphic effects of large floods: some examples from Italian rivers	259
Scorpio V., Cavalli M., Steger S., Crema S., Marra F., Zaramella M., Borgia M., Marchi L. & Comiti F. - Catchment response to different severity storm floods: channel variations and hillslope sediment coupling dynamics	260
Valente A., Cusano A., Magliulo P. & Russo F. - Historical floods in Benevento (southern Italy): a documentary approach	261
Fredduzzi A., De Rosa P. & Cencetti C. - Image processing to monitoring morphological changes in river systems: an application to River Paglia (River Tiber basin, central Italy)	262
S14. Geo-pollutants	263
Avataneo C., Capella S., De Luca D.A., Lasagna M. & Belluso E. - A new protocol to evaluate asbestos content in contaminated groundwater samples from Naturally Occurring Asbestos (NOA) rich areas..	264
Brugnone F., D'Alessandro W., Saiano F., Brusca L., Bellomo S., Prano V., Li Vigni L., Parello F., Sprovieri M. & Calabrese S. - Chemistry of atmospheric depositions over two polluted industrial areas of Sicily (Italy)	265
Cabassi J., Lazzaroni M., Giannini L., Mariottini D., Nisi B., Rappuoli D. & Vaselli O. - First continuous and real-time measurements of gaseous elemental mercury (GEM) from an UAV: the case study of Abbadia San Salvatore ex-mining area	266
Ciani F., Fornasaro S., Costagliola P. & Rimondi V. - Risk assessment to atmospheric mercury pollution in workplace indoor air: the case of <i>Central Italian Herbarium</i> (Museum of Natural History of Florence, Italy)	267
Floreni F., Acquavita A., Barago N., Petranich E., Faganeli J. & Covelli S. - Gaseous mercury evasion from the water-air interface at freshwater environments impacted by different anthropogenic sources	268
Fornasaro S., Morelli G., Rimondi V., Lattanzi P., Fagotti C. & Costagliola P. - Low resilience of a mercury mining area after reclamation: the case of the Siele mine (Mt. Amiata Mining District, Italy)	269
Fornasaro S., Delicato G., Ciani F., Morelli G., Rimondi V., Lattanzi P., Costagliola P. & Fioravanti M. - The potential wildfire effects on mercury remobilization from soil and biomass in the Mt. Amiata mining district	270
Gozzi C., Dakos V., Buccianti A., Vaselli O. & Nisi B. - Detecting Geochemical Regime Shifts in the compositional dynamics of the Tiber River waters (Italy)	271
Lazzaroni M., Vetusch Zuccolini M., Nisi B., Cabassi J., Rappuoli D. & Vaselli O. - Arsenic and mercury mass loads released by the Fosso della Chiusa creek waters (Mt. Amiata, central Italy)	272
Li Vigni L., Daskalopoulou K., Calabrese S., Cardellini C., Kyriakopoulos K., Ionescu A., Brugnone F., Parello F. & D'Alessandro W. - Geochemical characterization of water quality in karst systems of Greece	273
Maccelli C., Natali C., Nisi B., Casalini M., Vaselli O., Venturi S. & Avanzinelli R. - Natural and anthropogenic contributions of heavy metals from surface waters and suspended solids from the Valdinievole sub-basin (Tuscany, Central Italy)	274
Mattia M., Tuccimei P., Soligo M., Portaro M., Carusi C., Rainaldi E., Amoroso A.F. & Binelli M. - Using Radon as a natural tracer for NAPL (MTBE and total hydrocarbons) contamination: a case study in Roma (Italy)	275
Meloni F., Montegrossi G., Lazzaroni M., Nisi B., Rappuoli D. & Vaselli O. - Distribution of As, Hg and Sb in the mining waste dump of Abbadia San Salvatore (Mt. Amiata, central Italy)	276
Morelli G., Venturi S., Bicocchi G. & Rimondi V. - Heavy metals contamination in road dust and tree barks in the urban area of Firenze (Italy)	277

Nannoni A., Piccini L., Costagliola P., Gabellini P. & Cioni R. - Physical pollution of karst aquifers caused by marble quarrying: the case of the Apuan Alps, Italy	278
Pavoni E., Petranich E., Fontolan G., Signore S. & Covelli S. - Mercury in the water column of the Gulf of Trieste is still an environmental issue: the legacy of the Idrija mine twentyfive years after its closure.....	279
Taussi M., Nisi B., Vaselli O., Cabassi J., Raco B., Doveri M. & Menichini M. - Dissolved nitrates in the lower Metauro River aquifer (Marche Region, central Italy): a long-lasting story	280
Vetuschi Zuccolini M. & Pittaluga S. - The Geochemical Numerical Model of Liguria: a stochastic tool to evaluate the uncertainty of elemental concentration estimates	281
Bloise A., Punturo R., Giorno E. & Ricchiuti C. - Potentially toxic elements (PTEs) associated with asbestos chrysotile, tremolite and actinolite in the southern Apennines (Italy)	282
S15. Coastal erosion	283
Borzi L., Chiarella D., Barbagallo V. & Di Stefano A. - Shoreline and environmental changes detection in the gulf of Gela, southern Sicily (Italy)	284
Borzi L., Spada P., De Pietro R., Distefano S., Barbagallo V. & Di Stefano A. - Diachronic and environmental analysis in the Ragusa province, southern Sicily (Italy)	285
Brunetta R., Ciavola P. & Selvi G. - Sedimentary evolution of a young tidal flat in the Northern Part of the Po Delta (Italy): a Strategy for Future Building-with-Nature Management	286
De Falco G., Brambilla W., Conforti A., Molinaroli E. & Simeone S. - Sandy coasts facing climate change: accommodation space and availability of strategic sediment reservoirs dictates adaptation approaches	287
Duo E., Fabbri S., Grottoli E. & Ciavola P. - Uncertainty of UAV-derived DEMs and significance of detected morphodynamics: the case study of a scraped dune in the Northern Adriatic	288
Fabbri S., Grottoli E., Armaroli C. & Ciavola P. - High resolution and automated monitoring methodology (UAV) for vegetation and morphological dynamics involved in restoration projects in coastal sand dunes environments.	289
Fracaros S., Casagrande G., Bezzi A., Martinucci D., Pillon S., Bratus A., Fattor F. & Fontolan G. - Evidence of preservation of submerged sand banks: source-to-sink pathway enhanced by climate changes?.....	290
Grottoli E. - Revalue historical data to overcome the persistent lack of long-term datasets in coastal geomorphology: examples from Northern Ireland.	291
Luppichini M., Bini M., Berton A., Casarosa N., Merlino S. & Paterni M. - Investigate the coastal environment evolution: climatic and morphological cause and a new method for shoreline identification	292
Ruberti D., Buffardi C. & Vigliotti M. - The changing geomorphology of the Volturno delta and coast (northern Campania, Italy): human influence and geological architecture	293
Sarti G., Berton D., Cappucci S., Cipriani L.E. & Boninsegni G. - Reliable calculation of the anthropogenic sediment budget along the Northern Tuscany coast	294
Souto Cecon P., Ciavola P. & Armaroli C. - Performance of remote sensing algorithms for shoreline mapping under different beach morphodynamic conditions	295
Staro A., FitzGerald D. & Hughes Z. - The sequential flow of sand through tidal inlet, barrier island, and backbarrier reservoirs	296
Trogu D., Buosi C., Ruju A., Porta M., Biondo M., Ibba A. & De Muro S. - Short-term effects of storm events on the coastline morphology of a Mediterranean microtidal wave-dominated beach (Piscinnì, SW Sardinia)	297
Trogu D., Ruju A., Buosi C., Porta M., Biondo M., Ibba A. & De Muro S. - Assessing the role of reed and seagrass wracks in coastal protection. An example with numerical modelling integrated with videomonitoring system data in a southern Sardinia beach	298
Archetti R., Gaeta G., Liserra T. & Addona F. - A low-cost camera for coastal video monitoring	299
S16. Extreme environments	300
Argentino C., Savini A., Bünz S. & Panieri G. - Every cold seep tells a story: the case study of Leirdjupet Fault Complex, SW Barents Sea	301

Bastoni D., Buongiorno J., Morrison S., Hazen R., Prabhu A., Eleish A., Barry P., Bekaert D., Zahirovic S., Cordone A., Narkar S. & Giovannelli D. - Linking plate tectonic settings and microbial functions on a global scale	302
Cascone M., Lloyd K., Rogers T.J., de Moor M., Schrenk M., Barry P., Jessen G., Chiodi A., Selci M. & Giovannelli D. - Deeply-sourced springs microbial diversity: a window into the deep of the Earth	303
Dela Pierre F., Natalicchio M., Giunti S. & Pellegrino L. - Anatomy of a sulfur-bearing carbonate concretion (Late Miocene, Northern Italy): evidence of pulsating methane flows associated with the formation and destabilization of gas hydrates.	304
Giovannelli D. - Geosphere and Biosphere co-evolution through space and time	305
Romano E., Bergamin L., De Santis C., Di Bella L., Frezza V., Marassich A. & Provenzani C. - Paleocological reconstruction and modern analogues from foraminiferal proxies in the Middle Branch of Bue Marino Cave (Sardinia, Italy). Work in progress	306
Schmid-Beurmann H., Ivarsson M., Bach W. & Peckmann J. - Crypts in porous basanite: Extreme environments hosting fungal-bacterial micro-ecosystems in a deep-sea volcano, Vesteris Seamount, Greenland Sea.....	307
Borrelli M., Perri E., Bernasconi M.P., Le Pera E., Santagati P. & Spadafora A. - Neogene seepage carbonate deposition in the Crotona Basin (South Italy), preliminary results	308
S17. Carbonate rocks: from sedimentation to diagenesis	309
Carniti A., Della Porta G., Banks V., Stephenson M. & Angiolini L. - Facies architecture and diagenesis in a Mississippian mud mound complex from Derbyshire (UK)	310
Giorno M., Barale L., Bernasconi S., Bertok C., Frenzel M., Looser N. & Martire L. - Using hydrothermal dolomite to constrain the age and genesis of Alpine-type Pb-Zn deposits. Insights from the Gorno district (Lombardy, Italy)	311
Guido A., Sposato M., Palladino G., Vescogni A. & Miriello D. - Biological induced mineralization of early carbonate cements in an Anisian microbial buildup (Basilicata, Southern Italy)	312
Mancini A., Della Porta G. & Berra F. - Facies analysis and paleoenvironmental evolution of the Norian-Jurassic sedimentary successions of the Northern Calcareous Alps (Stumpfmauer-Austria)	313
Mancini A., Della Porta G., Swennen R. & Capezzuoli E. - Climatic and sea-level changes control travertine deposition: the <i>Lapis Tiburtinus</i> case study (Tivoli, Central Italy)	314
Montano D.--, Gasparrini M., Rohais S., Albert R. & Gerdes A. - Maximum and minimum depositional age models in lacustrine systems from jointly applied zircon and carbonate U-Pb geochronology (Yacoraite Fm., Maastrichtian-Danian, Argentina)	315
Randazzo V., Di Stefano P., Schlagintweit F., Todaro S., Cacciatore S. & Zarcone G. - The continental bridge between Africa and Adria: new insights from the Lower Cretaceous of NW Sicily (Italy)	316
Borrelli M., Manzo E., Santagati P. & Perri E. - Palaeoecology of late Triassic bioconstructions in the Western Tethyan domain (M.te Cocuzzo - North Calabria)	317
Perri E. & Borrelli M. - The Messinian pre-salt carbonate/evaporite platform system of the Central Mediterranean (Calcare di Base Fm - North Calabria).....	318
S18. Geology and ecosystems	319
Del Viscio G., Morsilli M., Posenato R., Frijia G., Moro A. & Mezga A. - <i>Chondrodonta</i> (Bivalvia) proliferation in Cretaceous peri-Adriatic shallow-water carbonates: a comparative study	320
Gastaldello M.E., Agnini C., Dallanave E., Westerhold T., Lam A.R., Drake M.K., Dickens G.R., Sutherland R. & Alegret L. - Late Miocene-early Pliocene Biogenic Bloom: a Tasman Sea perspective	321
Giovannelli D. - Trace element availability at the interface between planetary evolution and life emergence	322
Gordini E., Donda F., Falace A., Orlando Bonaca M., Donnici S., Ciriaco S., Baradello L., Belletti R., Bergamasco A., Cotterle D., Deponte M., Flander Putrle V., Lipej L., Lorenzon S., Petronio L., Pitacco V., Polajnar G., Segaric M., Sigovini M. & Tosi L. - Unveiling the secrets of the Northern Adriatic Sea: the TRETAMARA project for their management, valorization and conservation	323
Guastella R., Marchini A., Capotondi L., Caruso A., Cobianchi M., Cosentino C., Evans J., Langone L., Lecci R. & Mancin N. - History of a foraminiferal invader: the Canal opening, the tsunami and the global warming	324

Guido A., Rosso A., Sanfilippo R. & Belmonte G. - Role of metazoan and bacteria in cryptic bioconstructions of confined marine settings (“Lu Lampiune” Cave, Otranto, Apulia)	325
Leonelli G. & Chelli A. - Evolution of the forested landslide slope along the Parma Torrent: first results of an integrated approach	326
Melis R., Covelli S., Floreani F., Petranich E. & Bouchet V.M.P. - Sensitivity of benthic foraminifers in environmental biomonitoring of coastal areas in the northern Adriatic Sea (Italy)	327
Pilade F., Lozar F., Dela Pierre F., Natalicchio M., Mancini A.M., Albano L. & Gennari R. - The dark layer at the Messinian Zanclean boundary: a glimpse on the refilling of the Mediterranean at the end of the Messinian salinity crisis	328
Selci M., Giovannelli D., De Marco R., Spagnoli F., Tramontana M., Droghini E., Dinelli E., Annibaldi A. & Manini E. - Benthic microbial community structure across the Adriatic sea and the role of terrigenous inputs	329
Varzi A.G., Savini A., Micallef A. & Cantafaro A. - A geomorphological study of graben structures offshore the Maltese Archipelago with characterisation of associated physical habitats	330
Viganò A., Dallanave E., Alegret L., Westerhold T., Sutherland R., Dickens G.R. & Agnini C. - Calcareous nannofossils and geochemistry as paleoclimatic tracers across Eocene-Oligocene transition (IODP Site U1509, Tasman Sea)	331
Lo Bue G., Guastella R., Marchini A. & Mancin N. - Are foraminiferal tests selected or randomly picked by <i>Sabellaria alveolata</i> (Linnaeus) to form its arenaceous bioconstructions?	332
Raffi I., Persico D., Villa G. & IODP Expedition Science Party. - Calcareous nannofossils at IODP Site U1553, a reference paleoceanographic record for the Paleogene	333
S19. Paleo-climatic transitions	334
Caggiati M., Pecorari M., Riva A., Gale L., Celarc B. & Gianolla P. - Evidence of the Carnian Pluvial Episode from the sedimentary record of the Southern Alps and Outer Dinarides	335
Columbu A., Spötl C., Fohlmeister J., Hu H., Chiarini V., Hellstrom J., Cheng H., Shen C.C. & De Waele J. - The last deglaciation in Italy: timing and pattern from a precisely dated stalagmite	336
De Santis L., McKay R., Kulhanek D.K., Di Roberto A., Gales J., Perez L.-- & the IODP Expedition Scientific Party - IODP Exp. 374 provides clues into the dynamics of the Antarctic Ice Sheet during Cenozoic climate transitions	337
Douss N., Lucchi R.G., Rebesco M., Princivale F. & Knies J. - Sedimentary processes at the Isfjorden continental margin: preliminary results from lithological study of two long Calypso cores	338
Fontana A., Mozzi P., Rossato S. & Ronchi L. - Alluvial megafans in Europe at the transition between LGM and Late Glacial	339
Geniram A., Colizza E., De Santis L., Giglio F., Khim B.K., Bergamasco A., Gales J., Kuhn G. & Torricella F. - LGM - Holocene sedimentary dynamics by multidisciplinary analysis of three box cores collected East to the Hillary Canyon (Eastern Ross Sea, Antarctica)	340
Krizova B., Consorti L., Tunis G., Struck U., Franceschi M., Bonini L. & Frijia G. - Isotope Stratigraphy (C and Sr isotopes), Facies analysis and Rudists distribution in the Upper Cretaceous shallow water carbonates of the Friuli Carbonate Platform.....	341
Lucchi R.G., Caricchi C., Sagnotti L., Musco M.E., Giorgetti G., Caburlotto A., Morigi C., Husum K., Laberg J.S., Douss N., Macri P. & Accettella D. - Extensive episodic melting of the paleo Svalbard-Barents Sea Ice Sheet during last 60 ky	342
Maron M., Satolli S., Onoue T., Bertinelli A. & Rigo M. - Rock-magnetism as indicator of the Norian-Rhaetian paleoclimate	343
Pochini E., Colleoni F., Forte E., Bergamasco A., Farneti R., Bensi M., Kovacevic V., Castagno P., Budillon G., Falco P., De Santis L. & Rebesco M. - The Ross Sea sector oceanography: glacial vs present day.....	344
Salvi G., Sciuto F., Falco P., Castagno P., Geniram A., Ferneti M., Montagna P., Anderson J.B., McKay R., De Santis L., Kulhanek D.K. & the IODP Expedition Scientific Party - Ostracods fauna from IODP_374 Site U1523: a comparison with modern ones from the Western Ross Sea Area.	345
Santagati P., Bernasconi M.P., Borrelli M. & Perri E. - Paleoenvironmental and paleoclimate reconstruction of a Pleistocene (MIS 5.5) fossiliferous shallow-water deposit (Mar Piccolo, Taranto, Southern Italy) ...	346

Stocchi P. - The long-term relationship between sea-level change and sedimentation	347
Todaro S., Rigo M. & Di Stefano P. - Temperature vs extinction events: the case of Rhaetian peritidal carbonate succession from westernmost Tethys (Sicily)	348
Tolotti R., Corradi N., Colizza E., Caffau M., Baradello L., Burca M., Accettella D., Melis R., Morelli D. & Sauli C. - Ross Sea snapshots from the past – GLEVORS Project indirect and direct records	349
Torricella F., Melis R., Malinverno E., Fontolan G., Bussi M., Capotondi L., Del Carlo P., Di Roberto A., Geniram A., Kuhn G., Khim B.K., Morigi C., Scateni B. & Colizza E. - Environmental and Oceanographic Conditions at the Continental Margin of the Central Basin, Northwestern Ross Sea (Antarctica) since Last Glacial Maximum	350
Conte R., Rebesco M., De Santis L., Colleoni F., Bensi M., Bergamasco A., Kovacevic V., Gales J., Zgur F., Accettella D., De Steur L., Ursella L., McKay R., Kim S., Lucchi R.G. & the IODP Expedition Scientists - Bottom current control on sediment deposition between the Iselin Bank and the Hillary Canyon (Antarctica) since the late Miocene: an integrated seismic-oceanographic approach	351
S20. Resilience of oceanic ecosystems preserved in the geological record.....	352
Bach L. - Learning from the present to inform the past and future of coccolithophore calcification	353
Benedetti A., Bosellini F.R. & Papazzoni C.A. - Preliminary attempt to assess the resilience of shallow-water communities through biodiversity patterns of Neotethys Paleogene larger foraminifera and corals	354
Bettoni C. & Bottini C. - How coccolith size changed in response to paleoenvironmental variations during the Early Aptian to Late Albian?	355
Cardelli S., Krizova B., Consorti L., Bonini L., Covelli S., Franceschi M., Morsilli M., Posenato R. & Frijia G. - First evidence of the Oceanic Anoxic Event -2 in the shallow-water carbonates of the Friuli Carbonate Platform: geochemical and sedimentological data	356
Crippa G. - From the Early Pleistocene to the Recent: how is <i>Xenophora crispa</i> biomineralization varied? ..	357
D'Onofrio R., Luciani V., Schmidt D.N., Barrett R., Fornaciari E., Giusberti L., Frijia G. & Adatte T. - Evidence of Tethyan calcareous plankton dwarfism across the ETM2	358
Gallagher K., Bordiga M., Cerino F., Beran A., Cabrini M. & Lupi C. - Living and Fossil Coccolithophores: a tool to understand past and future climate changes	359
Gandolfi A., Luciani V., D'Onofrio R., Tiepolo M. & Cannaò E. - Mg/Ca Paleotemperatures changes at the demise of planktic foraminiferal genus <i>Morozovella</i> across the Early Eocene Climatic Optimum (Site 1263, Southern Atlantic Ocean)	360
Luciani V., D'Onofrio R., Dickens G.R. & Wade B.S. - The impact of Early Eocene Climatic Optimum Change on coiling direction of planktic foraminifer <i>Morozovella</i> from the Atlantic Ocean: quantitative and stable isotope data	361
Montanaro A., Falzoni F., Iannace A. & Parente M. - The record of the end-Triassic mass extinction in the Southern Apennines carbonate platform (Italy)	362
Viaretti M., Crippa G. & Angiolini L. - Brachiopods from Iran and their record of the end-Permian events....	363
S21. Holocene climate	364
Cacho I., Pena L.D., Frigola J., Català C., Campderrós S., Inglavaga R., Checa H., Pérez-Asensio J.N., Margaritelli G. & Lirer F. - Oxygen minimum zone formation in the Western Mediterranean sea associated to last deglacial melting and sea level rise	365
Columbu A., Pérez-Mejías C., Regattieri E., Depalmas A., Melis R., Cheng H. & De Waele J. - Exploring climate and environmental changes in Sardinia around the end of the Nuragic Era	366
Forti L., Regattieri E., Shen C.C., Hsun Ming H., Isola I., Morandi Bonacossi D., Conati Barbaro C., Koliński R., Boschi C. & Zerboni A. - A speleothem-based reconstruction of the Late Quaternary climate-environmental-human nexus in the Kurdistan Region of Iraq	367
Lamy F. - Deglacial and Holocene variations of the southern westerly wind belt and sea surface temperatures as recorded in Chilean margin sediments	368
Lozano J.G., Bran D.M., Donda F., Caffau M., Baradello L., Grossi M., Vilas J.F., Lodolo E. & Tassone A. - Perito Moreno glacier: a multidisciplinary study on its Late-glacial and Holocene dynamics	369

Margaritelli G., Lirer F., Schroeder K., Alberico I. & Caruso A. - The planktonic foraminifera <i>Globorotalia truncatulinoides</i> in Central - Western Mediterranean Sea during the Little Ice Age	370
Masi A. - Palaeo-Science and History, a bridge between palaeoenvironmental research and history in Late Holocene	371
Michelangeli F., Di Rita F., Lirer F. & Magri D. - A Late Holocene pollen record from marine sediments in SE Sicily	372
Trias-Navarro S., Cacho I., Pena L.D., De la Fuente M., Català A., Frigola J., Paredes E., Garcia-Solsona E., Caruso A. & Lirer F. - Water-Masses exchange through the Strait of Sicily during the Last Deglacial and Early Holocene	373
S22. Quaternary climate and sea level change	374
Caporizzo C., Gracia F.J., Mattei G., Martín-Puertas C., Stocchi P., Aucelli P.P.C. - Holocene RSL evolution in the Bay of Cádiz (SW Spain) from stratigraphic sea-level markers	375
Cerrone C., Salvatore M.C., Baroni C. & Vacchi M. - New insights into the RSL evolution in the Ross Sea area, Antarctica	376
Cerrone C., Ascione A., Robustelli G., Sacchi M. & Tonielli R. - New insights into the stratigraphic and tectonic evolution of the Policastro Gulf, southern Apennines, Italy	377
Cossu G., Sechi D., Pascucci V. & Andreucci S. - The Rock Surface luminescence Dating: a new technique to date Late Quaternary gravelly marine terraces	378
Distefano S., Gamberi F., Borzi L., Barbagallo V. & Di Stefano A. - Morphological quaternary evolution of coastal plain in response to sea-level changes: example from South-East Sicily	379
Fontana A., Felja I., Juračić M., Furlani S., Rossato S., Novellino M.D., Ravazzi C., Correggiari A.M., Vigliotti L., Asioli A. & Taviani M. - An expanded Holocene archive at the mouth of Mirna River (northern Istria, Croatia)	380
Novellino M.D., Fontana A., Ravazzi C., Pini R., Felja I., Juračić M., Furlani S., Asioli A., Correggiari A.M. & Vigliotti L. - Core MIR1 (Istria Peninsula, Croatia): an expanded paleo-environmental archive for the Eemian and Last Interglacial	381
Pappalardo M., Vacchi M., Bini M., Lischi S., Zerboni A. & Ribolini A. - Biological and geomorphological indicators of mid-Holocene raised sea levels along the southern coast of the Arabian Peninsula (Sultanate of Oman)	382
Ronchi L., Fontana A. & Correggiari A.M. - Transgressive lagoons and paleo tidal inlets in the northern Adriatic Shelf: geomorphological indicators of the last RSL rise	383
Ronchi L., Fontana A., Novak A., Correggiari A.M. & Poglajen S. - When the Isonzo River flowed near Trieste, Koper and Piran: evolution of the fluvial systems in the Gulf of Trieste since the LGM	384
Rossato S., Fontana A., Felja I., Juračić M. & Mazzini I. - Evolution of the Neretva river delta (Croatia) and its importance for reconstructing the holocene relative sea-levels	385
Rovere A., Cerrone C., Vacchi M. & Fontana A. - Last Interglacial sea-level proxies in the Western Mediterranean: a contribution to the World Atlas of Last Interglacial Shorelines database	386
Sechi D., Andreucci S., Cocco F., Cossu G. & Pascucci V. - The Late Quaternary composite marine terrace of Cala Mosca site, SW Sardinia (Italy): global sea-level change VS Tectonic activity	387
Vacchi M. - On the variability of the postglacial sea-level changes along the western African coasts	388
Zingaro M., Salvatore M.C., Baroni C., Capolongo D., Mastronuzzi G., Scicchitano G. & Vacchi M. - Implementing a cartographic repository of the postglacial Antarctic paleo-shorelines	389
S23. The cosmic challenge: from interplanetary dust to the bricks of life	390
Barghini D., Pratesi G., Gardiol D., Taricco C., Bizzarri I., Carbognani A., Colombetti P., Di Martino M., Franchi I.A., Greenwood R.C., Hammond S.J., Mancuso S., Moggi Cecchi V. & Rubineti S. - Characterization of Cavezzo, the anomalous L5 chondrite recovered by PRISMA	391
Bruschini E., Carli C., Morlok A., Capaccioni F., Stojic A., Weber I., Renggli C., Klemme S. & Hiesinger H. - VNIR bidirectional reflectance spectroscopy of natural impact glasses	392
Carli C., Bruschini E., Barbaro A., Cuppone T., Murri M., Domeneghetti M.C. & Pratesi G. - VNIR spectral properties of olivine bearing Ungrouped Achondrites	393

Casalini M., Cuppone T., Avanzinelli R., Carli C., Barbaro A., Langone A., Domeneghetti M.C. & Pratesi G. - Preliminary results on mineralogical and geochemical analysis on ungrouped achondrites	394
Daly L., Lee M.R., Piazzolo S., Griffin S., Chung P., Campanale F., Cohen B.E., Hallis L.J., Trimby P.W., Bagot P.A.J., Bazargan M., Pickersgill A.E., Halpin J., Smith W., Mcfadzean S., O'Brien A.C., Baumgartner R., Forman L.V. & Benedix G.K. - The geological history of a Martian volcano	395
Franza A., Faggi D., Morelli M. & Pratesi G. - Tell me who you are. The study of doubtful meteorites in meteoritics and its history. A case study	396
Gardiol D., Barghini D., Carbognani A., Di Carlo M., Di Martino M., Pratesi G., Riva W., Stirpe M., Volpicelli A. & the PRISMA collaboration - PRISMA: an italian network to recover freshly fallen meteorites ...	397
Iannini Lelarge S., Folco L., Masotta M. & Greenwood R.C. - Two different parent bodies for mesosiderites and HED: planetesimals evolution in the Vesta source region	398
Longobardo A., Mannel T., Fulle M., Kim M., Rotundi A., Della Corte V., Rinaldi G., Lasue J. & the GIADA and MIDAS teams - Physical properties of the 67P/Churyumov-Gerasimenko's dust revealed by the combined Rosetta's GIADA-MIDAS data analysis	399
Mari N., Alvaro M., Carli C., Pratesi G., Charlier B., Namur O., Morlok A., Hiesinger H., Domeneghetti M.C. & Capaccioni F. - Evolution of Mercury-like lavas through aubrite meteorites: looking for sample analogs for the ESA/JAXA BepiColombo mission	400
Moggi Cecchi V., Fabrizi L., Pratesi G., Franchi I.A. & Greenwood R.C. - Mineralogical and textural data of Northwest Africa 12722, a new carbonaceous chondrite from Sahara	401
Musolino A., Magazzù A., Bronte Ciriza D., Suttle M.D., Rotundi A., Brucato J.R., Polimeno P., Saija R., Iati M.A., Foti A., Donato M.G., Gucciardi P.G., Maragò O.M. & Folco L. - Optical Tweezers: Evaluating their analytical potential for space sample-return missions	402
Pantaleone S., Corno M., Rimola A., Balucani N.-- & Ugliengo P. - <i>Ab-initio</i> modelling of Fe ₂ NiP-H ₂ O interaction: a phosphate factory for Early Earth	403
Stephant A., Carli C. & Anand M. - Water in the inner Solar System: insights from achondrite meteorites	404
S24. The contribution of geology to the knowledge of solar system bodies	405
Balbi E., Cianfarra P., Ferretti G., Crispini L. & Tosi S. - Tectonic styles of the Martian crust: insights from Cerberus Fossae and Thaumasia Highlands	406
Bisolfati M., Pisello A., Porreca M., Zinzi A. & Perugini D. - Comparison of emissivity spectra from Mars surface and laboratory rock samples: preliminary results	407
Di Pietro I., Schmidt G., Tangari A.C., Pondrelli M., Salese F., Silvestro S., Fairén A.G. & Marinangeli L. - Aqueous alteration of layered deposits within Sera and Jiji, Mars	408
El Yazidi M., Pozzobon R., Penasa L., Debei S. & Massironi M. - A Volcano-tectonic activity: possible scenario beyond the formation of the rift systems in Noctis Labyrinthus (Mars)	409
Galluzzi V., Ferranti L., Giacomini L. & Palumbo P. - Mapping the regional tectonic asset of the Discovery quadrangle of Mercury	410
Galluzzi V., Ferranti L., Lucchetti A., Stephan K., Pajola M., Cremonese G. & Palumbo P. - Dome-sulcus interactions within Melkart crater on Ganymede	411
Giacomini L., Carli C., Zambon F., Galluzzi V., Ferrari S., Massironi M., Altieri F., Ferranti L., Palumbo P. & Capaccioni F. - Geological sites of interest in Kuiper quadrangle (H06): an integrated analysis between morphological and spectral characteristics	412
Guzzetta L., Lewang A., Hiesinger H., Ferranti L. & Palumbo P. - Geologic map of the Beethoven Quadrangle (H07), Mercury	413
Head J.W. - The Apollo Lunar Exploration Program: how Increasing Science Capabilities Resulted in a Revolutionary New View of the Moon	414
Martellato E., Marchi S., Galluzzi V., Palumbo P. & Rotundi A. - Cratering Record and Age Dating of the Galilean Satellites	415
Penasa L., Pozzobon R., Galluzzi V., Brandt C.H., Frigeri A., Lucchetti A., De Toffoli B., Naß A., Rossi A.P. & Massironi M. - Mappy: a python plugin to ease geological mapping with QGIS	416
Pozzobon R., Massironi M., Penasa L. & Ferrari S. - 3D geo-model of Rembrandt basin on Mercury: structural framework and infilling	417

Pozzobon R., Rossi C., Lucchetti A., Massironi M., Pajola M., Penasa L., Munaretto G. & Cremonese G. - 3D geo-model of Uruk Sulcus structures (Ganymede): insights and implications	418
Rossi C., Lucchetti A., Massironi M., Pozzobon R., Penasa L., Munaretto G., Pajola M. & Cremonese G. - Strike-slip and shortening in the dark terrain of Ganymede	419
Surkov Ye., Slyusarev I., Kaydash V., Rychagova V., Hritsunenko H., Belskaya I., Shkuratov Yu. & Shevchenko V. - Search for geologically young areas on asteroid surfaces using the phase-ratio method.....	420
Tomasi I., Massironi M., Meyzen C.M., Sauro F., Pozzobon R., Penasa L., Santagata T., Martinez-Frias J. & Mateo Mederos E. - Development of inflated lava tubes in analogous planetary environments: the case of La Corona system (Lanzarote, Canary Islands)	421
Tusberti F., Pozzobon R. & Massironi M. - Geologic mapping and landing site characterization in Copernicus Crater (Moon)	422
S25. Urban Geology and Geomorphology	423
Ballabio N., De Franco R., Vezzoli G. & Caielli G. - Geophysical characterization of Ceppo Lombardo Formation (Po Plain NE of Milan, Italy): new data from passive seismic surveys	424
Bausilio G., Di Napoli M., Annibali Corona M., Di Martire D., Guerriero L., Tufano R. & Calcaterra D. - Evaluation of anthropogenic sinkhole susceptibility in the city of Naples (Italy) through a presence-only algorithm	425
Bigini T. & Melelli L. - Ancient waters in historical city centers: collectors of multidisciplinary knowledge..	426
Casagrande G., Fracaros S., Bezzi A., Martinucci D., Petruzzellis F., Pezzi A., Pillon S., Tordoni E., Bacaro G., Nardini A., Manzan M., Fontolan G. - A quantitative approach for the urban adaptation policy to climate change (SECAP): an application to some geological hazards	427
Giacomelli S., Zuccarini A., Di Paola G., Severi P., Martini A. & Berti M. - 3D geological model of Bologna urban area: preliminary findings	428
Guerra V., Baioni D., De Donatis M., Guerra C. & Nesci O. - Urban geomorphology as a tool to evaluate coastal variations in historical times. An example from the Italian adriatic coastal cities	429
Lazzari M. - Urban geology and geomorphology of Potenza (Basilicata, southern Italy)	430
Lentini A., Benjumea-Moreno B., Bricker S.H., Chiessi V., Devleeschouwer X., Galve J.P., Guarino P.M., Kearsey T., Leoni G., Puzzilli L.M. & La Vigna F. - Preliminary activities aimed to cluster EU cities by a geological point of view: The Urban Geo Footprint tool	431
Mandarino A., Stamatopoulos L., Mpalatsas G., Simoni H., Papagiannopoulos K. & Brandolini P. - Peri-urban geomorphology in Western Patraikos Gulf area associated with Peiros River evolution (NW Peloponnese, Hellas)	432
Pagano M., Massimi V. & Ortolano G. - SecureGeoStreet: a semi-automatic approach of risk assessment for road network	433
Reynard E. - Urban geomorphology – The need to increase the links with urban planning	434
Sellers C., Di Napoli M., Annibali Corona M., Calcaterra D., Guerriero L., Miele P., Di Martire D. & Ramondini M. - Landslides affecting buildings in rapidly growing areas of Cuenca (Ecuador)	435
Silvani F. - The key role of anthropic underground cavities in the urban geology: the Etruscan Well in Perugia's upper town (Umbria, central Italy)	436
Terrone M., Mandarino A., Olivari F. & Faccini F. - Geomorphological hazard and environmental impact along the urban coastal strip of Camogli city (Liguria, Italy)	437
Terrone M., Piana P., Brandolini P. & Faccini F. - Identification computation and mapping of anthropic landforms in urban areas: case studies in the historical centre of Genoa (Unesco World Heritage)	438
Valente E. - The hidden rivers of Naples (southern Italy)	439
Vergari F., Pica A., Brandolini P., Melelli L. & Del Monte M. - Geomorphological classification of the landscape in urban areas: anthropogenic landforms in Genoa, Rome and Perugia	440
Vitagliano E., Di Martire D., Riccardi U., Guerriero L., Di Maio R. & Calcaterra D. - Study of periodic dependencies among ground deformation, rainfall and sea level in the city of Naples (Italy)	441
Alvioli M. & Melelli L. - Urban areas and geological and geomorphological setting in Central Italy	442
Aringoli D., Bufalini M., Dall'Asta A., Farabollini P., Gentilucci M., Leoni G., Materazzi M., Pambianchi G. & Zambrano M. - The role of urban geology and geomorphology in the prevention and management of natural risks: the example of the town of Camerino	443

Capizzi P., Cappadonia C., Bonfardeci A., Martinello C. & Agnesi V. - The district of San Giacomo dei Militari: reconstruction of the subsoil of the most ancient area of the Palermo City (Italy)	444
Primon S., Dalla Santa G., Fagarazzi O., Ceccato F., Boaga J., Galgaro A. & Mozzi P. - The geology and geomorphology of the city of Venice and possible site effects related to the 1117 earthquake	445
Sannipoli E.A. & Cencetti C. - Geological-geomorphological conditioning on the development of historical centers: the example of Gubbio (Umbria, central Italy)	446
S26. Geo-heritage, geoparks, geo-itineraries	447
Bernardini F., Vinci G., Pipan M., Forte E., Mocnik A. & Višnjić J. - Integrating airborne laser scanning and full 3-D Ground Penetrating Radar for the investigation of protohistoric structures in Croatian Istria..	448
Brombin V., Barbero E., Saccani E., Lepitkova S., Milevski I., Ristovski I., Milcov I. & Bianchini G. - East Vardar Ophiolite from North Macedonia revised within the GECCOSPARK know-how exchange programme (KEP) project funded by the Central European Initiative (CEI)	449
Brombin V., Lepitkova S., Milevski I., Ristovski I., Milcov I., Conticelli S. & Bianchini G. - New geochemical data on ultrapotassic volcanic rocks from North Macedonia: revised within the GECCOSPARK know-how exchange programme (KEP) project funded by the Central European Initiative (CEI)	450
Carpino S., Franza A., Morelli M. & Pratesi G. - Meteoritics as a source of well-being for people with dementia: an experience in the Planetary Sciences Museum of Prato (Italy)	451
Cirrincione R., Fazio E., Lanzafame G., Maniscalco R., Modica L., Punturo R. & Ruggieri R. - The Pietra Pece: mining history and production cycle	452
Cirrincione R., Lottero S., Ortolano G., Palermi S. & Santagati S. - The UNESCO Aspromonte Geopark: the Migrant Lands Geopark, where the Footsteps of the Water and the Greeks of Calabria meet the Spirituality of Stones, between “Asper”-Mountain and “Asper”-Sea	453
Colacicco R., Gallicchio S., D’Ambrogi C., Capolongo D., Girone A., Maiorano P. & Marino M. - Three-dimensional geological cartography for geotourism: the Regional Reserve of Montalbano Jonico	454
Corrado S., Tuccimei P. & Atouabat A. - The Urban Park “Tevere alla Magliana” (Rome) as a natural laboratory for the teaching and dissemination of Natural Sciences in the context of the Agenda2030 for Sustainable Development	455
D’Arpa C., Di Stefano P. & Cerami M. - The overturned succession of “La Rocca” (Roccapalumba): an historical geosite for the pelagic Jurassic of Sicily	456
De Donatis M., Duro F., Martelli F., Zanarelli L., Viganò E., Lello E., Bazzoli N., Marin G., Tassi M.V., Di Vizio R., Ottaviani F., Pesaresi F., Pappafico G.F. & Susini S. - “Il Cammino” of the Montefeltro’s Duke: a cross-section of geological and human history in the heart of Umbria-Marche Apennines	457
Fantoni R., Castello P., Pfeifer H.-R., Renzulli A., Riccardi M.P. & Santi P. - Soapstone in the Alps. Usage in the exploitation areas	458
Garzarella A., De Luca V., Raffi I., Agostini S., Di Martino L. & Liberatoscioli E. - The Maiella UNESCO Global Geopark designation as source of new perspectives and policies for Geo-heritage and Sustainable Development in Italy	459
Gianolla P. & Geological heritage operating network - The UNESCO Dolomites geological heritage: present challenge and future opportunity	460
Kolar-Jurkovšek T. & Jurkovšek B. - Fossils of Slovenia	461
Luppichini M., Bini M. & Noti V. - The use of paleogeographic reconstructions as a vector to increase the visibility of archaeological and geological heritage	462
Mozzi P., Beltrame C., Primon S., Medas S., Fontana A., Boaga J., Ricci G. & Artioli G. - Geoarchaeology of the Venice lagoon: strongholds, paradigms and a look forward	463
Novak M. & Mrak I. - Tackling geohazard in populated geoheritage sites	464
Piano C. & Bensi S. - Geoheritage and geodiversity: an integrated path between Geoconservation, enhancement of natural assets, dissemination and geotourism	465
Pica A. & Del Monte M. - Geoarchaeology Role in the Urban Environmental Analysis: Rome’s landscape anthropic transformations	466
Pisani L., De Waele J., D’Angeli I.M., Gàzquez F., Antonellini M. & Liberatoscioli E. - The Cavallone Caves geotrail project: explaining the Majella UNESCO Global Geopark	467

Principe C., Pallecchi P., Clemente G., Gallet Y. & Genevey A. - Origin of Tuscan architectural bricks a multidisciplinary analyses	468
Provenzale S., Todaro S., Randazzo V. & Di Stefano P. - Geoconservation in Sicily: the example of Isola delle Femmine (Palermo, Italy)	469
Sabato L. & Tropeano M. - Following a water drop: an immersive geotouristic itinerary in the “Sassi”, the rupestrian old town of Matera (Basilicata - Southern Italy)	470
Tropeano M., Caldara M., Cicala M., Dell’Aglia M.G., De Santis V., Festa V., Fiore A., Francescangeli R., Iurilli V., La Perna R., Lippolis E., Mastronuzzi G.A., Nicoletti D., Parise M., Petruzzelli M., Sabato L., Simone O., Spalluto L., Stigliano E., Tarantini F. & Valletta S. - MurGEOpark (southern Italy): the last piece of Adria, the (almost) lost continent!	471
Valente A., Ciarcia S., Cusano A., Russo F. & Guadagno F.M. - The enhancement of the geological heritage of the Taburno-Camposauro Regional Park as an opportunity for sustainable development in Campania (Italy)	472
Valente E., Casaburi A., Finizio M., Papaleo L., Sorrentino A. & Santangelo N. - Multidisciplinary geoitinerary in the Cilento, Vallo di Diano and Alburni Geopark (southern Italy)	473
Viani C., Bollati I.M., Amato G.M., Apuani T., Bagnati T., Fazio E., Forzese M., Giansetto A., Giardino M., Maniscalco R., Montomoli C., Palomba M., Pelfini M., Perotti L., Tognetto F., Zanoletti E., Zerboni A., Zucali M., Alkindi M., Fassoulas C., Fraga De Araujo Pereira R., Garcia-Rodriguez M., Gomes H., Knight J. & Schilling M. - 3GEO – Geoclimbing & Geotrekking in Geoparks: a new UNESCO IGCP project for geoheritage communication and education	474
Viganò A. & Geological heritage operating network - The Dolomites World Heritage Geotrail: travelling geological landscapes	475
Vinci G., Fontana A., Musina G., Mancini L., Lubritto C., Liccioli L. & Bernardini F. - Beached swords from the Marano lagoon (northern Adriatic) reveal ancient land-sea connections and recent coastal evolution	476
Visalli R., Ferlito C., Caffò S., Spina S., Punturo R., Ortolano G. & Cirrincione R. - The Etna Park geotrails network: new digital tools to know and learn the geological peculiarities of the volcano through nature trails	477
Zarlenga F. - Geo-heritage, geoparks, geo-itineraries are the normal/temporal evolution of the concept of “Geosites”, Opened problems in Italy.	478
Bensi S., Brustia E., Daniele G., Ferliga C.C.L., Giovagnoli M.C., Mancinella D., Perissinotto M.L., Piano C. & Pompili R. - Sharing of the criteria and methodology for the management of the national geological heritage	479
Blumetti A.M., Brustia E., Delfini C., Giovagnoli M.C., Guerrieri L., Piccini M. & Pompili R. - A project for the protection and enhancement of surface faulting effects induced by the 2016 Central Italy seismic sequence along the Monte Vettore – Monte Bove fault system	480
Busetti A., Bezzi A., Massari G. & Piano C. - Coastal geosites and their valorization: a case study along the North-Eastern Italian Adriatic coast	481
Carbone S., Di Stefano P. & Monaco C. - The Atlas of Geosites of Sicily	482
Piano C. & Bensi S. - A geopark on Karst plateau – a transboundary project	483
Rossi F.G., Madonna S., Milli S., Tentori D. & Cornamusini G. - The functional recovery of the Poggio la Vecchia Quarry: an Example of Geo-Heritage conservation	484
S27. Geology, food and health	485
Bonomo S., Fasola S., Ferrante G., La Grutta S., Lirer F., Marchetti P., Palazzi E., Pelosi N., Verlatto G., Vesentini R. & Vieggi G. - Link between drought climatological indicators and asthma in the general population	486
Costantini E.A.C. - Soil functional factors of Italian wines	487
Cruciani G. & Ferretti C.G. - Vineyards and clay minerals: multi-technique analytical approach and correlations with soil properties	488
Ferretti C.G. - Geology and food quality: research and results on ecological indicators that shape terroir and wine quality	489

Garzarella A., Di Cecco V., Manzi A., Di Santo M., Zulli C. & Di Martino L. - The Maiella UNESCO Global Geopark: from geodiversity to biodiversity, a journey through environmental and agricultural conservation.	490
Ghiotto M., Valeriani L., Bragagni A., Pucci C., Malpaganti A., Casalini M., Pelacani S., Conticelli S., Riccio R., Moretti S. & Tommasini S. - Tracing the provenance of Tuscan Extra Virgin Olive Oil using Sr isotopes and Rare Earth Elements	491
Giustini F., Procesi M., Finioia M.G., Sassi R., Mazzoli C. & Ciotoli G. - Mapping the Geogenic Radon Hazard Index of Italy	492
Marrocchino E., Ferretti G., Leone A., Ragazzi C., Tessari U. & Vaccaro C. - Geochemical characterization and granulometric analysis of agricultural soils as a tool for geographical origin identification: preliminary results from the case study of Massenzatica (Ferrara)	493
Pedri U., Haas F. & Pertoll G. - Possible site-specific effects on wine quality based on various vineyard sites in a heterogeneous area like South Tyrol	494
Sanna L., Pusceddu C., Sanna U. & Floris G. - Temporal and spatial variation for radon concentrations in the Su Mannau cave (Fluminimaggiore, Italy).....	495
S28. Geosciences at School 2021	496
Beccaceci A. & Paris E. - “How much earth is on my plate?” A special challenge-game to evaluate foods’ ecological footprint	497
Borghini A., Pieraccioni F., Gioncada A. & Bonaccorsi E. - Hands-on activities at distance for teachers: difficult but not impossible!	498
Furlani C., Mozzi P., Bottazzi F., Cianci E., Blanc K., Coltellacci D., Console F., Lualdi M., Cerretti A., Iannace A., Chiodetti A.G., Ferrara G., Di Palo L., Di Pietro S., Ingui M.R., De Simone G. & Ranchino M.A. - Geosciences and Education: what Role can Libraries play?	499
Gianolla D., Casalini R. & Paris E. - The neanderthalian site of Monte Circeo (Italy): an exposition to show the classic work of A. C. Blanc as a geoscience educational tool	500
Iannace A., Di Donato V. & Piegari E. - Music analogies for teaching long term changes in Earth’s climate ..	501
Lozar F., d’Atri A., Perazzone A., Tonon M. & Stella I. - Evaluating the effectiveness of geoscience education in the field: the <i>Tourinstones</i> experience	502
Macario M. & Paris E. - Teaching Earth Sciences during pandemic time: problems and (some) solutions	503
Occhioni M., Beccaceci A. & Paris E. - An ICT approach to link Geosciences and Sustainability	504
Occhipinti S.-- - Maps, Earth apps and land images: different tools for different skills	505
Piangiamore G.L., Maramai A. & De Santis A. - Experiments of E-Learning: EAS (Episodes of Situated Learning) during the pandemic	506
Realdon G., Correia G.P., Coupechoux G., Juan X., Baskar R., Bourgeois Y. & King C. - European Geosciences Union (EGU) Education Field Officer programme: a review after two years of activity ..	507
Realdon G., Beccaceci A., Occhioni M., Gastaldi M., Invernizzi M.C. & Paris E. - Ocean Literacy (OL) and Sustainability in the UN Decade of Ocean Sciences: current status and perspectives for the Italian schools	508
Stoppa M., Zuccheri L., Finocchiaro F. & Battisti G. - The “QuaderniCIRD” journal. An open access digital resource for permanent teacher training	509
Tonon M.D., Caretto A. & Gerbaudo A. - Arte, estetica ed ecologia: un connubio ad alto potenziale educativo.....	510
Totaro F., Vitagliano E., Santangelo I., Ammirati L., Accomando F., Petrosino P. & Di Maio R. - Entrepreneurship and communication skills of university students for disseminating geo-science to school	511
Verzaro F., Pelfini M., Apuani T., Morgandi T. & Bollati I.M. - Geoclimbing and Gamification for teaching Earth Sciences in the secondary schools	512
Vitagliano E., Marsiglia P., Mele P., Manzo R., Salone R., Barone A., Natale J., Guarino A., Verde M., D’Uva F., Mandato B., Barbaro O., Montanaro A., Iannace A. & Di Maio R. - Student orientation under COVID-19 conditions: an example of online dynamic Earth Sciences Labs presentation	513
Banfi A. & Veronesi P. - Che mostra! Un angolo di geologia nel nostro liceo	514
Conte G., Bilotta A., De Caterini G. & Leoni G. - TURN On your smartphone and go	515

Locritani M., Massetti L., Merlino S. & Paterni M. - The 'Adopt a beach at a distance' project	516
Rossi R., Cefis M., Furlani C., Corbolante M., Ferrarese F., Tricomi F., Abbà T. & Mozzi P. - Mapfly: a new research and teaching model on the cartographic heritage of the University of Padova	517
S29. Open Poster Session	518
Antonelli M., Petti F.M., Sacco E., Conti J., Spalluto L., Sabato L., Tropeano M., Festa V., Montrone G., Petruzzelli M., Cardia S., Marino M., La Perna R., Marsico A., Piscitelli A., Barracane G. & Francescangeli R. - The hadrosaur and nodosaur ichnoassemblage from the Altamura dinosaur tracksite (early Campanian; Apulia, southern Italy)	519
Botta S., Petriglieri J.R., Barale L., Piana F., Pacella A., Tomatis M. & Turci F. - Fibrous antigorite veins in Liguria and Calabria serpentinites: a preliminary assessment for NOA risk evaluation	520
Buccione R. & Mongelli G. - Compositional and geometrical features in ore deposits: A comparison between karst bauxite deposits	521
Caldareri F., Sulli A. & Todaro S. - Use of alternative methodologies useful for identifying relict sands on the continental shelf, in order to nourish eroded beaches	522
Fabbi S., Maffucci R., Smeraglia L., Albanesi L., Billi A., Carminati E. & Cavinato G.P. - The role of post-orogenic normal faulting in hydrocarbon migration in fold-and-thrust belts: insights from the Latina Valley (central Apennines, Italy)	523
Fabbi S., Romano M., Cipriani A. & Citton P. - Upper Jurassic coral assemblage from condensed pelagic deposits of the Umbria-Marche Apennines (central Italy)	524
Maestrelli D., Corti G., Keir D. & Sani F. - Analogue models of Rift-Rift-Rift triple junctions	525
Marchesini B., Mirabella F., Aldega L., Petrelli M., Carminati E. & Barchi M.R. - Circulation of sulfate-rich fluids along extensional faults in the Apennines: an example from the Gubbio normal fault	526
Mercuri M., Smeraglia L., Curzi M., Tavani S., Pignalosa A., Maffucci R., Billi A. & Carminati E. - Pre-vs. syn-folding fracturing: insights from field and virtual structural analyses along the Pietrasecca anticline (central Apennines)	527
Mercurio C., Argueta Platero A.A., Castillo Ramos L.A., Vessia G., Rainone M.L. & Conoscenti C. - Seismically-induced landslide estimation at regional scale in El Salvador volcanic territory	528
Merella M., Pandolfi L., Collareta A., Kotsakis T., Rook L., Casati S., Di Cencio A. & Bianucci G. - Living along a Pliocene Tuscan coast: terrestrial, freshwater and marine vertebrates from La Serra quarry (Tuscany)	529
Parenti C., Coratza P., Fioroni C. & Malferrari D. - Factors controlling the evolution of badlands in different northern apennine formations	530
Parrino N., Pepe F., Burrato P., Dardanelli G., Di Maggio C., Corradino M. & Pipitone C. - Looking for active faults in a low strain rate region through a multidisciplinary land-to-sea approach: clues from the North-Western Sicily (southern Italy)	531
Stefanović J., Džinić B., Della Porta G. & Radivojević D. - New data from the Lower Cretaceous carbonate platform deposits of Dimitrovgrad section (Southeastern Serbia)	532
Stori L., Diez J.B., Juncal M., De la Horra R., Borruel-Abadía V., Martín-Chivelet J., López-Gómez J., Barrenechea J.F. & Ronchi A. - Regional stratigraphic correlation, palaeogeography and age insights on the Anisian successions of Sardinia through new and revised palynological analysis	533
Valeriani L., Paternostro S., Sepulveda Birke J.P., Cioni R., Tommasini S. & Conticelli S. - Study of the origin, the evolution, and the distribution of Monte Amiata mafic enclaves	534
Vuletić M., Đerić N., Bujtor L., Džinić B., Bogičević K. & Nenadić D. - Late Albian ammonites from Kotraž (Topola area, Central Serbia) and their biostratigraphic implications	535
Antonelli M., Sacco E., Conti J., Bernardi M., Avanzini M., Tomasoni R., Pignatti J., Romano M. & Petti F.M. - Geothematic map and ichnological review of dinosaur tracks from the Lavini di Marco ichnosite (Early Jurassic, Southern Alps, NE Italy)	536
Fabbi S., Romano M., Cipriani A. & Citton P. - Sclerobiont Bryozoans from the Maiolica of the Umbria-Marche Domain (Northern Apennines, Italy)	537
Ortolano G., Pagano M., Visalli R., Angì G., D'Agostino A., Muto F., Tripodi V., Critelli S. & Cirrincione R. - Modern interoperability concepts applied to the new Geological Structural map of the Serre Massif Upper crust	538

PhD Day	539
Agnini C., Amadori C., Corrado S. & Vannucchi P. - The Italian Geological Society towards an equal and inclusive future	540
Antonelli M., Petti F.M., Sacco E., Petruzzelli M. & Wagensommer A. - The occurrence of carcharodontosaurs in the Apulian Carbonate Platform: new insights from the Early Cretaceous ichnological record of Molfetta (Southern Italy)	541
Cavhaleiro L., Dickson A.J., Erba E., Faucher G., Gambacorta G., Jenkyns H.C. & Wagner T. - Further disentangle the role of redox dynamics in black shales: new geochemical observations from the Toarcian Fish Level (Sogno Core - Lombardy Basin, northern Italy).	542
Corno A. - Stratigraphic, structural and metamorphic characterization of tectonic units in the Western Alps	543
D'Agostino A., Ortolano G., Zucali M. & Visalli R. - Automatic X-ray image analysis of rock samples: a machine learning approach to explore geoscience data	544
D'Andrea N., Baldassini N. & Di Stefano A. - High-resolution calcareous nannofossil biostratigraphy of Neogene successions: comparison between Mediterranean and ocean realms	545
Egidio E., Lasagna M., Mancini S. & De Luca D.A. - The impact of climate change on groundwater temperature of the Piedmont Po plain (NW Italy): preliminary results	546
Florida G. & Viccaro M. - Sicily as a pilot region for micro-zonation of the low-enthalpy geothermal potential	547
Geniram A., Colizza E., Melis R. & Colleoni F. - Evolution of the West Antarctic Ice Sheet from the inner continental shelf of the Glomar Challenger Basin to the Ross Sea slope (Eastern Ross Sea, Antarctica) during the late Quaternary	548
Gerbaudo A., Tonon M. & Caretto A. - Walk to learn, learn to walk: an educational practice to reconnect geology with sustainability	549
Innocentini S., Madeira J., Quartau R. & Casalbore D. - Gravitational, Erosional Sedimentary and volcanic processes on the submarine environment of Flores and Corvo islands (Azores archipelago)	550
Locchi S., Zanchi A. & Zanchetta S. - Evidence of syndepositional tectonics during the Early Permian in the Orobic Basin (central Southern Alps, N Italy)	551
Maccelli C., Natali C., Nisi B., Casalini M., Vaselli O., Venturi S. & Avanzinelli R. - Surface waters, suspended solids, and sediments from the Nievole River Valley sub-basin (Tuscany, Central Italy): a preliminary environmental evaluation	552
Menichelli I., De Gori P., Funicciello F. & Chiarabba C. - First steps toward the definition of the deep structure and dynamic of the circum-Mediterranean orogens	553
Minniti M., Nicotra E. & Viccaro M. - Triggering dynamics of explosive eruptions at Stromboli volcano: nature and spatial-temporal constraints of replenishment processes with implications for the Early Warning system setup	554
Mitillo N., Cirilli S. & De Dominicis L. - An integrated approach to assess the physicochemical properties of carbonate rocks for CO ₂ storage: a case study from Central Apennine (Italy)	555
Neziri Z. & Salic R. - Review and comparative analysis of available fault database for the territory of N. Macedonia	556
Petroccia A., Carosi R., Montomoli C., Iaccarino S. & Vitale Brovarone A. - Structural-thermal constraints in the hinterland-foreland transition zone: new insights from the Nappe Zone of the Sardinian Variscan belt	557
Russo D., Fiannacca P., Fazio E., Cirrincione R. & Mamtani M.A. - Relationships between shear zones, mechanisms of emplacement and structural evolution from supra- to sub-solidus of late-Variscan granitoids from the Serre Batholith (southern Italy)	558
Sorci A., Ghorbani M., Rettori R, Spina A. & Cirilli S. - Palaeoenvironmental and palaeogeographic evolution of Southwestern and Central Iran during Palaeozoic	559
Tognetto F. - High mountains, human activities, and climate change: multitemporal field monitoring along routes and around refuges of the Monte Rosa massif.	560
Zampa L.S., Camerlenghi A., Creati N., Busetti M., Lodolo E. & Palmieri F. - Gravity and magnetic data restoration with new processing and interpretation techniques	561

First evidence of the Oceanic Anoxic Event -2 in the shallow-water carbonates of the Friuli Carbonate Platform: geochemical and sedimentological data

Cardelli S.*¹, Krizova B.¹, Consorti L.², Bonini L.³, Covelli S.³, Franceschi M.³, Morsilli M.¹, Posenato R.¹ & Frijia G.¹

¹Dipartimento di Fisica e Scienza della Terra, Università di Ferrara. ² Servizio geologico d'Italia ISPRA, Roma.

³ Dipartimento di Matematica e Geoscienze, Università di Trieste.

Corresponding author e-mail: crdsrm@unife.it

Keywords: OAE-2, Oceanic Anoxic Event, shallow water carbonate platform, mid-Cretaceous, Cenomanian-Turonian.

The Cenomanian–Turonian Oceanic Anoxic Event 2 (OAE-2) represents a major perturbation of the global carbon cycle associated with the extensive deposition of organic carbon-rich deposits (black shales) in the oceanic basins, worldwide. Numerous studies have suggested that enhanced volcanic activity at mid-oceanic ridges and large igneous province (LIP) eruptions may have acted as potential trigger mechanisms of this event. These phenomena caused excess CO₂ degassing and a consequent dramatic temperature increase in the oceans and atmosphere. Although the geochemical, sedimentological and paleontological changes throughout the OAE-2 are well-known in basinal deposits, the shallow-water carbonate counterpart is still poorly investigated. The OAE-2, however, strongly impacted both deep and shallow-water ecosystems. The limited information on the expression of the OAE-2 in carbonate platforms represents a critical gap in our understanding of ecological responses to abrupt paleoenvironmental/paleoclimatic changes in the mid-Cretaceous, given that shallow shelves accounted for a significant part of the global ocean biological productivity and carbonate production.

In this work we present new high-resolution geochemical and sedimentological data across the OAE-2, based on bivalve shells and bulk rock material from a well exposed upper Cenomanian – lower Turonian section, in the carbonate successions of the Friuli Carbonate Platform (FCP) cropping out in the Karst area, near the city of Gorizia. Biostratigraphy and carbon-isotope stratigraphy were used to establish a precise stratigraphic dating and for high resolution correlations with coeval shallow-water and reference open-ocean sections. Sr-isotope data, Hg concentration and other geochemical proxies have been used to highlight possible evidence of volcanic activity and changes in weathering and to evaluate paleoenvironmental conditions on the FCP during the OAE-2. Results highlight that, during the event, the FCP underwent major biotic and geochemical changes that these fluctuations can be compared to those occurring in coeval carbonate platforms of the Tethys during the OAE-2.