



**QU**  
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Cover photo: A view of the Mont Blanc, the highest peak of the European Alps and of the European continent.

Credits: Ilaria Mazzini, National Research Council - IGAG, Italy

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 FOR QUATERNARY  
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Established in 1928, INQUA is the representative body for Quaternary science world-wide. INQUA is dedicated to removing barriers and to fostering diversity and inclusivity by prioritising funding for early career and developing country researchers to enable their participation in the international scientific networks that INQUA supports. INQUA promotes – and operates according to – a philosophy of inclusivity, not discriminating against any individual on the basis of race, colour, religion, gender, gender identity or expression, sexual orientation, genetics or disability. We encourage you to join INQUA through any of its Commissions, and contribute to the development of Quaternary science worldwide.  
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# Optimistic

At the United Nations Climate Change Conference (COP 27) in Sharm El-Sheikh, Egypt (6 – 20 November 2022) the current climatic change and how to deal with the current crisis was discussed and during the closing ceremony November 20, the UN Secretary-General António Guterres spoke about climate chaos, climate crisis and he stated that “we face a burning planet” and “our planet is still in the emergency room”.

## PASES - WORKSHOP

That weekend I was travelling to La Serena (Chile) to attend the PAGES-INQUA Workshop for Early-Career Researchers about Past Socio-Environmental Systems (PASES). The original meeting was scheduled for 2020 but the in-person meeting had to be postponed twice because of the Covid pandemic. But finally it was possible to come together. In La Serena I met an inspiring and highly motivated group of young scientists that presented data from different parts of the world; data that show past environmental changes and how human societies dealt with these changes. Data that show the resilience of Human societies. And the different presentations show that the current crisis is not unique; the data from the past show that is still hope for the future. A positive feeling that is supported by the fact that the data were presented by a group of excellent, young scientists that created at the meeting, a positive atmosphere.

## OPTIMISTIC

I left La Serena with a positive and optimistic mood despite of the statements of the UN-Secretary-General. Of course, we should not underestimate or deny the current climatic crisis and the fact that we are facing huge challenges. However, I strongly believe that we will finally be able to deal with the current climate crisis and that we will also overcome the pandemic as well as the current political crisis, but it will all take time. Time that we can use to face the challenges, to draw our conclusions e.g. by looking at the past, and to make the necessary changes.

## INQUA ROMA 2023 CONGRESS

Time for Change is the theme of the upcoming INQUA Rome 2023 Congress with a very ambitious program that emphasizes the critical role of Quaternary sciences in contributing the knowledge we need to face current societal

and climate challenges. Around 4000 abstracts have been submitted; a large number that inspires the organizing committee of the Congress to work hard to make the Roma2023 INQUA Congress a big success.

I am optimistic about the future, the future of INQUA, about the Roma2023 Congress, about our future cooperation. Together we can make the difference; together we will survive. I wish that you all have reasons to be optimistic about the future and to start 2023 with a positive mood.

Looking forward to meet you all next year at the INQUA Congress in Roma

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## Chiba GSSP dedication ceremony

A Global boundary Stratotype Section and Point (GSSP) is a single point defined in a designated geological section that serves to define the base of a unit (a boundary) within the Geological Time Scale (GTS). All official units in the GTS are defined in this way. Following the ratification of a GSSP, it is customary for a dedication ceremony to be held at the GSSP site, where possible. The Quaternary now has six GSSPs, but for various reasons none until now has received a dedication ceremony.

On Saturday, May 21, 2022, the Mayor of Ichihara City, Chiba Prefecture, Japan, hosted a dedication ceremony for the Chiba Global boundary Stratotype Section and Point

(GSSP). This GSSP defines the base of the Chibanian Stage and Middle Pleistocene Subseries. The GSSP was ratified in 2020 (Suganuma et al., 2021, 2022) but the ceremony had been postponed owing to travel restrictions imposed by the Covid-19 pandemic.

The ceremony was held at the impressive and spacious clubhouse of the PGM Minami Ichihara Golf Club, in the centre of the Boso Peninsula and a short drive from the Chiba section. It was attended by many dignitaries and representatives of Japanese scientific, cultural, and administrative agencies. Those playing an active role in



Left: Mr Joji Koide, Mayor of Ichihara City, hosted the ceremony and gave the opening address.  
Right: Mr Toshihito Kumagai, Governor of the Chiba Prefecture, offering his congratulations.



Unveiling ceremony, before and after. Left to right: Ministry representative, Mr Tsutomu Yoshida (donor), Mr Toshihito Kumagai, Mr Joji Koide, pupils of the Kamo Gakuen elementary and junior high school, Prof. Stanley Finney, Prof. Martin Head, Prof. Hiroshi Nishi, and Prof. Makoto Okada. (Ph: Prof. Yusuke Suganuma)



The Chiba GSSP and the dedication ceremony attracted widespread media coverage across Japan.

the ceremony included Mr Joji Koide as host and Mayor of Ichihara City, Mr Toshihito Kumagai as Governor of the Chiba Prefecture, representatives of the Government of Japan, Prof. Stanley Finney as Secretary General of the International Union of Geological Sciences (IUGS), Prof. Hiroshi Kitazato as Treasurer IUGS, Prof. Martin J. Head as Vice-Chair and former Chair SQS, Prof. Hiroshi Nishi as Chair of the Japanese National Committee for IUGS, Science Council of Japan, Prof. Yoshiki Saito as Chair of the Japanese National Committee for INQUA, Science Council of Japan, Prof. Makoto Okada and Assoc. Prof. Yusuke Suganuma as representatives of the Chiba composite section research community, and the chairman of the town of Tabuchi. Pupils of the Kamo Gakuen elementary and junior high school were also invited to join

the unveiling ceremony. In addition to brief speeches by the above, video recordings were screened in which Prof. John Ludden as President of IUGS and Prof. David Harper as Chair of the International Commission on Stratigraphy both sent message of congratulations, and the installation of the GSSP plaque at the Chiba section was shown. This was followed by presentations of Certificates of Appreciation to Golden Spike donors: Fuji Sash Co and Fuji Light Metal Co.

The event concluded with the unveiling of the ceremonial version of the GSSP “Golden Spike” plaque, an exact replica of the GSSP plaque affixed to the Chiba section. The unveiled ceremonial GSSP plaque provided an irresistible opportunity for photographs. The Chiba dedication ceremony and field trip received intense media coverage owing to the



*On the right bank of the Yoro River, with the Chiba section offscreen to the left.*



*Prof. Okada (centre, with back facing), explaining the GSSP to Prof. Nishi (left), Prof. Kitazato, and other dignitaries.*



*Approaching the Yoro River gorge with displays on the right explaining the significance of the GSSP and the Matuyama–Brunhes paleomagnetic reversal which serves as its primary guide.*



*Assoc. Prof. Yusuke Suganuma (right) and Prof. Makoto Okada, the lead authors of the Chiba GSSP proposal at the GSSP plaque. The GSSP is located at the base of the Ontake-Byakube-E (Byk-E) tephra bed, a regional stratigraphic marker, and is 1.1 m below the directional midpoint of the Matuyama–Brunhes paleomagnetic reversal. The GSSP has an astronomical age of 774.1 ka (Suganuma et al., 2021).*



Fumihisa Kawabe discusses the significant impact of the Chibanian GSSP in elementary and secondary school education in Japan.



A dinner in Tokyo, near the top of a tall skyscraper, rounded off the activities of the day. Left to right: Profs. Makoto Okada, Martin Head, Hiroshi Nishi, and Hiroshi Kitazato.

enormous public interest in the Chiba GSSP, which is the first such geostandard to be designated in Japan.

Following the ceremony, a field trip to the Chiba section itself allowed the delegates to see the installed GSSP plaque. The weather in May is unpredictable but the rain mostly held off during the visit to the outcrop.

A related one-day symposium entitled “The Chibanian: Its Academic Significance and Social Importance” was held on May 24. The symposium was organised by the Science Council of Japan, and held at its auditorium in central Tokyo in a hybrid format (on-site and online). The opening address was given by Prof. Takaaki Kajita (President of Science Council

of Japan, and a 2015 Nobel laureate in Physics). Among the numerous talks given, were those by Hiroshi Kitazato (“The Role of IUGS in the Approval of the Chibanian GSSP and its Significance for Geological Research in Japan”), Stanley Finney (“GSSPs – International Geostandards and Milestones in the History of the Planet Earth”), Martin J. Head (“Recent development of Quaternary Stratigraphy”), Makoto Okada (“Characteristics of Chibanian GSSP and its scientific significance”), Fumihisa Kawabe (“Descriptions of Chibanian in school textbooks”), and Joji Koide (“Academic research support from the standpoint of basic local government”). A publication summarizing the talks presented at this symposium is forthcoming.



Prof. Hiroshi Kitazato (Treasurer IUGS) with Prof. Stanley Finney (Secretary General IUGS).

#### AFFILIATIONS

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## PAGES-INQUA workshop “Past Socio-Environmental Systems”

After two years of postponement, the [PASES](#) (Past Socio-Environmental System) in person workshop took place in La Serena (Chile) from 20/11/2022 to 24/11/2022. The workshop was jointly organized by INQUA and PAGES Early Career Researchers (ECRs) networks. PASES aimed at facilitating scientific exchange between ECRs from a broad range of disciplines within the overarching topic of climate-environment-cultural changes, which is the core of both PAGES' and INQUA'S missions. Participants were selected for the event originally planned for 2020, but postponed to 2022 due to the pandemic. From a total of 70 abstract initially submitted in 2019, 20 were selected and invited to La Serena together with four keynote speakers. Participants joined the

workshop in La Serena from eleven countries and around 80 people registered to attend virtually.

The workshop was held at the Archaeological Museum of La Serena (*Museo Arqueológico de La Serena, in Spanish*), under the coordination of the Center for Advanced Studies in Arid Zones (CEAZA). It comprised three days of oral presentations, four keynote talks, break-out activities, and one day field excursion.

The keynote talks focused on:

- *Volcanoes, people and vegetation in the Northern Andes: disentangling the socio-ecological memory through paleoecology and art.* Dr. Catalina Gonzalez -





- Universidad de los Andes (Colombia)
- *The whole is not the sum of the parts: synthesizing archaeological, paleoclimatic and paleoecological records.* Dr. Yoshi Maezumi - The Max Planck Institute for Geoanthropology (Germany)
- *Nearshore paleoceanographic conditions and human adaptation through the Holocene Archaeological marine shells as socio-ecological proxies from Central Chile (31°S).* Dr Carola Flores - School of Archaeology, Universidad Austral de Chile & Center of Advanced Studies in Arid Zones (CEAZA; Chile)
- *Synchronies, asynchronies and coincidences between nature and culture in northern Chile's past.* Dr Antonio Maldonado - CEAZA (Chile)

Presentations were organized into the following thematic sessions:

- Novel techniques in past human-environmental couplings
- Socio-Environmental Systems in the Anthropocene
- Synthesizing archaeological, paleoclimatic and paleoecological records

The PASES workshop also included a breakout group activity, where participants were divided in three groups to discuss the overarching theme of resilience of past climate-environment-cultural systems. Each group worked on three main questions taken from an original pool of 150 questions posed by the ECR community as part of the original workshop registration process in 2019. These questions revolved around types of proxies and archives, semantic barriers, and analytical frameworks in past socio-environmental systems. Additionally, each group focused on different challenges and opportunities of the above mentioned topics. The outcome of each breakout group is going to be presented in a PAGES Magazine Special Issue, among other author's contributions, providing an excellent opportunity to draw leadership and authorship to ECRs.

The field excursion was a great opportunity to get to know the rich cultural heritage of the Coquimbo region in northern Chile, learning when humans occupied the area, and how they used its resources and interacted with the environment. It included a visit to the archaeological landmarks of the Guanaqueros city, 60 km south from La

Serena. The visit was supported by an enthusiastic team of local guides, which have been recently trained by a social and scientific initiative that aims to preserve the unique archaeological heritage of the city led by Dr. Carola Flores, associated researcher at CEAZA and PASES keynote speaker. The tour ended with a walk through the *Valle de el Encanto*, one of Chile's cultural heritage sites known for its enigmatic rock art and its "piedras tacitas", human carved rocks of which its origins and function are still debated.

Additionally, outreach talks were organized to bridge the gap between the scientific community and the public, which were held at the Archaeological Museum and targeted high school students as well as local people from the Coquimbo Region.

Looking forward, PASES will continue fostering interdisciplinary discussions with two workshop-centered endeavors: a [special session](#) (#130) during the XXI INQUA Congress 2023, Rome (Italy), and a [PAGES Magazine Special Issue](#). Please contact [xavier.benito.granell@gmail.com](mailto:xavier.benito.granell@gmail.com) if you are interested in writing a short article (deadline January 20th, 2023).

We are grateful to all the participants who showed interest in PASES activities throughout these challenging times, including the online activities that took place in 2021. Overall, the PASES workshop has achieved its aims by creating new collaborations and bridging research from various disciplines that we hope will endure as well as serve as a platform for future ECR generations seeking to organize international interdisciplinary workshops.

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With contributions from M. Head, P. Pieruccini, V. Yanko-Hombach, S. Yang, Z. Xu

## Recent and future activities of the SACCOM Commission 2022

During the past year, SACCOM has continued to help promote and coordinate international cooperation and integrate regional and national chronostratigraphic nomenclature through stratigraphic methods and dissemination of stratigraphic knowledge. SACCOM's mission is to study the Quaternary period through stratigraphy and chronology and provides a forum to discuss and establish stratigraphic investigations and classification throughout the world. Its two international focus groups (1612F and 1709), a working group (Loess and Pedostratigraphy Working Group), and a project (INQUA-SQS International Field Workshop) are moving ahead with their activities despite many challenges. These activities involve several hundred scientists and more than one hundred early career researchers from distant parts of the world.

### SEQS-DATESTRA - IFG 1612F

#### Database on Terrestrial European Stratigraphy

Led by Prof. Pierluigi Pieruccini, this International Focus Group aims to improve, and complete their database on terrestrial stratigraphy

that is designed for sites with stratigraphic importance across Europe. The COVID-19 pandemic mobility restrictions affected much of their plans again over the past year and they had to cancel the conference in-person Conference planned for 2021 in Poland. But they were able to organise the meeting online in December 2021 which focussed on '*Quaternary Stratigraphy – palaeoenvironment and humans in Eurasia*'. The conference was organized by the Department of Palaeozoology, Faculty of Biological Sciences, University of Wrocław, and several institutions acted as co-organizers including: the Section on European Quaternary Stratigraphy (INQUA-SEQS), Polish Academy of Sciences (PAS), Committee for Quaternary Research at PAS, and the Polish Geological Society. The Conference presentations (oral as well as poster) were focussed on:

- the major regional subdivisions of the Quaternary in European and Asian regions;
- karst and cave sequences;
- Quaternary stratigraphy, paleontology, chronology, geomorphology, and tectonics;
- humans and environment in

the Quaternary – environmental and faunal changes, hominid dispersion in Europe;

- interglacials and glacials in Europe.

Ninety-three participants from 9 different countries (Austria, Croatia, the Czech Republic, Hungary, Italy, the Netherlands, Poland, Russia, and Ukraine) attended the meeting. The majority of the participants represented Poland, Russia, and Ukraine. Most presentations were multi-authored. Thirty-five oral reports and 26 posters were presented. At the end of the meeting, Dr. Nataliya Zaretskaya (Institute of Geography, Russian Academy of Sciences) invited all participants to the INQUA-SEQS 2022 Meeting scheduled for 21–28 August 2022 on '*East European Palaeolithic sequences: Stratigraphy, Geomorphology, Chronology, Palaeoenvironment*' in the East European Palaeolithic Belt (Russia). Unfortunately, this conference was cancelled due to the political and military situation in Ukraine. Therefore, the activities were suspended since many SEQS colleagues come from Russia, Ukraine, and adjacent countries, and one of the main goals of SEQS is

to link together the Eurasian continent allowing cross-continent correlations of the Quaternary Stratigraphy.

### POCAS - IFG 1709F

## Ponto-Caspian Stratigraphy and Geochronology

Led by Prof. Valentina Yanko-Hombach, this Focus Group was also greatly affected by the Russian invasion of Ukraine. However, activities continued including expeditionary studies carried out in the Middle Volga region, where the deposits of the maximum Late Pleistocene transgression of the Caspian Sea-Khvalynian are exposed. Natural outcrops in the valley of the Maly Karaman river were complemented by drilling cores. The selected samples are currently being analyzed to help determine the age and paleogeographic conditions of the maximum stage of the Khvalynian transgression of the Caspian Sea. Their work also involves carrying out geoarchaeological research in the Volga delta region to help reconstruct the paleogeographic conditions of the existence of the settlement and correlate the development of the territory with fluctuations in the level of the Caspian Sea. Research is also including work in the Manych depression to help determine the age, paleogeographical and paleohydrological conditions of the flow of Caspian waters into the Black Sea basin during MIS 4-2. Much of this work is being postponed due to COVID-19 and Russian aggression against Ukraine.

### IFG 1707F

## Loess and Pedostratigraphy

In August 2022, the Loess and Pedostratigraphy Working Group organized the INQUA LoessFest online. The meeting received 125 contributions, with 158 participants from 15 countries. During the four days of the meeting, 7 invited keynote speeches, 57 oral papers, and 32 posters were presented. The conference brought together the latest developments in loess

studies and marked groundbreaking achievements in this field. Of particular note was the archaeological research presented at the conference which suggests that the Eurasian Loess Belt was important in helping the evolution of human civilization. Special issues of Quaternary Research and Quaternary International are planned for the papers presented at this meeting.

The working group also organized the Loess Early Career Researchers (ECR) Workshop that was held online in August 2022. The ECR workshop acted as a professional development workshop and brought together early career scientists and students from all over the world to learn from senior scientists, especially about the newly developed methods in loess studies and interdisciplinary approaches. In the workshop, five lectures on different topics were given by Drs. Jan-Pieter Buylaert, Pieter Vermeesch, Gabor Ujvari, Samuel Albani, and Huayu Lu. These inspiring lectures introduced the recent advances in geochronological methods, provenance studies, geochemical proxy indicators, dust modeling, and quantitative paleoclimate reconstructions. Thirty-two ECRs from eight different countries/regions registered and actively participated in the interactive discussions related to these lectures. More than one hundred scientists joined online for each day of the workshop, and in total there were 800 attendees. To expand the impact of the workshop and as requested by some of the ECRs who missed the workshop, the recording of these lectures have been uploaded to YouTube. The links will be shared through the Loess Newsletter and posted on the website of INQUA Loess and Pedostratigraphy Working Group. These video recordings will be available online this year.

## INQUA-SQS activities

Work continues from the INQUA-SQS International Field Workshop that was held during 1-3 September 2021, in Sicily, which comprised the INQUA-SACCOM GELSTRAT Symposium in Palermo (1-2 September 2021, see next page) and a one-day field trip to visit the GSSP for the Gelasian Stage at Monte San Nicola near Gela in southern

Sicily. This was followed by three days of sampling. An additional sampling campaign was undertaken from April 28 to May 4, 2022, which included sampling of blocks of the Nicola bed. Approximately, 400 samples have been sampled spanning a ~10 m interval across the Neogene-Quaternary boundary at the GSSP section. Blocks of the sapropellic Nicola bed will be analyzed at ultrafine stratigraphic resolution. The working group plan to present preliminary results at the INQUA Congress in Rome this coming summer.

SACCOM's activities continue to span the whole of the Quaternary period and identify critical times to focus on for the benefit of the broader community. Details of SACCOM's activities and updates are available on the [INQUA website](#). SACCOM is particularly aware of the need for societal relevance and outreach, diversity, and inclusion, supporting early career researchers, and training the future workforce. We welcome creative ideas for bringing our community together to promote and enhance our research during these tough times. Please reach out to the [Commission Officers](#) to provide suggestions or opportunities to advance our commission's goals. And please join SACCOM!

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## GELSTRAT – An international program to restudy the Gelasian Stage GSSP

The INQUA-SACCOM-SQS International Field Workshop was held during 1–3 September, 2021, in Sicily, Italy; and comprised the GELSTRAT Symposium in Palermo (1–2 September, 2021) and a one-day field trip (3 September, 2021) to visit the Global boundary Stratotype Section and Point (GSSP) for the Quaternary System, Pleistocene Series, and Gelasian Stage at Monte San Nicola near Gela in southern Sicily. The organizers were Antonio Caruso (Palermo, Italy), Martin J. Head (Brock, Canada), Adele Bertini (Florence, Italy), and Maria Marino (Bari, Italy). The symposium itself was held in the magnificent 14th-century Sala delle Capriate of the Palazzo Steri, Palermo, and attendance was both in-person and virtual (Figure 1). The purpose of the symposium was to review earlier research on the Monte San Nicola section and to inaugurate GELSTRAT, an international program to reinvestigate / reanalyse the GSSP at high stratigraphic resolution employing modern methods. A crew from TGR Italian national television was present both at the symposium



**FIGURE 1:** The GELSTRAT Symposium held in the Sala delle Capriate of the Palazzo Steri, Palermo.



**FIGURE 2:** Monte San Nicola near Gela in southern Sicily; the type locality of the Quaternary System, Pleistocene Series, Lower Pleistocene Subseries and Gelasian Stage. The prominent sapropelic Nicola bed and the position of the GSSP are shown.

and the Monte San Nicola section.

The Gelasian Stage was initially ratified in 1996 as the final stage of the Pliocene Series, recognising that Northern Hemisphere glaciation intensified around this time. Only in 2009 was the use of this GSSP extended to define also the Quaternary System and Pleistocene Series. The GSSP is placed at the base of a marly layer overlying the sapropelic Nicola bed, a regionally prominent layer approximating the level of the Gauss–Matuyama geomagnetic reversal.

The Nicola bed corresponds to Mediterranean Precession-Related Cycle 250 and to Marine Isotope Stage (MIS) 103. The GSSP section (Figure 2) had not been studied in detail since its ratification. Therefore, following the one-day field trip on 3 September, 2021 (Figure 3), several additional days were allotted to clean the section and sample at high stratigraphic resolution. Heavy rain unfortunately curtailed activities on the third day, before sampling was completed.

A second visit to Monte San Nicola therefore took place during April 28 to May 4, 2022 (Figure 4). Around 400 samples, each representing 5 cm in stratigraphic thickness, have now been collected spanning a ~18 m interval across the Neogene–Quaternary boundary at the GSSP section. Narrow blocks of the sapropelic Nicola bed were also collected during this visit, and are being investigated in detail by Wiesława Radmacher and her team from the Polish Academy of Sciences in Kraków. A wide range of analyses for the GSSP samples is planned or in progress in laboratories around the world and includes: planktonic and benthic foraminifera, calcareous nanofossils, marine and terrestrial palynology (dinoflagellate cysts, acritarchs, spores, and pollen), trace



**FIGURE 3:** Participants of the one-day field trip to the Monte San Nicola GSSP. The stratotype is in the background.

fossils, paleomagnetism, foraminiferal stable isotopes, geochemistry, sedimentology, and clay mineralogy.

The Nicola bed itself is undergoing analysis at ultrafine stratigraphic detail employing many of the above approaches but also microstratigraphy, X-ray tomography, micro-XRF elemental analysis (ITRAX), Micro-RAMAN spectroscopy, and chemical component analysis (FTIR). Preliminary results will be presented during a special session at the INQUA Congress in Rome in 2023.

The International Field Workshop and inauguration of GELSTRAT was facilitated by an INQUA grant to Martin Head. In spite of the complications of COVID-19, this opportunity helped numerous research students and early career researchers become involved in an international research program of direct significance to the INQUA community. Documenting in detail the stratigraphic signals at the base of the Quaternary at its type locality will make global correlation more precise, and our integrated paleoclimate reconstructions will illuminate a crucial phase of Earth history.



**FIGURE 4:** Wiesława Radmacher and Mateusz Mikolajczak sampling near the GSSP during a second visit to Monte San Nicola in May 2022.

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# Recent and future activities of the TERPRO Commission 2022

**C. Grützner**  
**TPPT - IFG 2008F**

## PATA Days in France

After a long break, TERPRO's IFG 2008F TPPT (Terrestrial Processes Perturbed by Tectonics) was now able to run its main in-person activity, the PATA Days. The meeting on Paleoseismology, Active Tectonics, and Archaeoseismology was held in Provence in Southern France and mainly organised by Magali Rizza, Stéphane Baize and their great team. Ca. 120 scientists from all over the world attended sessions on:

- Earthquakes of Plate Interiors,
- Archaeoseismology and Historical Earthquakes,
- Earthquakes Geology and General Contributions,
- Advances and Challenges in Dating,
- Advances in Earthquake Geology Techniques (Onland and Offshore),
- Contributions to Seismic Hazard Analysis, and
- Flash talks on every poster

presentation.

INQUA supported more than ten ECRs and DCRs with travel grants. In total, we had 132 scientific contributions, among them 61 talks and 71 posters.

An important part of the meeting were two field excursions. Jean-Francois Ritz and colleagues led the field trip to the 2019 Le Teil Earthquake ruptures and the trenches opened across the La Rouvière Fault, which is part of the Cévennes Fault System.

The second excursion was run by Arnaud Montabert, Georgia Poursoulis, Magali Rizza, Yann Klinger, and Laurent Bollinger and aimed at the Trévaresse Fault System and the epicentral area of the 1909 Lambesc Earthquake. (Download the [field trip guides here](#))

A separate post-meeting field trip was organized to see the Western Alps (led by Hervé Jomard, Riccardo Vassallo, Christophe Larroque, and Christian Sue). Topics were the epicentral area of the 1959 Ubaye earthquake, the High Durance and Serenne fault systems, gravitational deformation at the Argentera massif, and a visit of the

Bersezio Fault in the Orgials valley at the Lombarde pass.

Many thanks to the organization committee and to all helpers. Additional support came from CNRS, CEREGE, IRSN, UNESCO – Project IGCP-669 Ollin, Géoazur, IPGP, EDF, RESIF, CEA, Aix-Marseille Université, IRD, OCA, and UCA – many thanks!

**J. McCalpin**  
**TPPT - IFG 2008F**

## Future activities

2023: Summer School in Paleoseismology, Morphotectonics and Volcanotectonics; the school will be based at the University of Naples, Italy. ECRs and DCRs will attend a 6-day Summer School, including classroom lectures on modern neotectonic and volcanotectonics field techniques, and visits to nearby sites affected by earthquakes and volcanic eruptions. Field trips in paleoseismology will occur at classic sites, including the epicentral area of some of the largest historical earthquakes in Italy, the 1980 Irpinia earthquake and the



*The PATA crowd in France during the PATA days*

1857 Great Napolitan earthquake firstly surveyed by Robert Mallet, the author of the seminal textbook "Principles of Seismology". Field trips in volcanotectonics will occur in the Campi Flegrei caldera, one of the areas hosting the largest volcanic risk in the world, and on the famous Vesuvius volcano, responsible for the destruction of Pompeii and Herculaneum in 79 AD.

This will be unique opportunity to favour networking between ECRs and DCRs with world-class scientists at the top of the fields of active tectonics and volcanotectonics. The school will introduce the students to the most up-to-date techniques of analysis of problems related to active tectonics and volcanotectonics.

#### **F. Livio** **EDITH - Project 2009F**

### EDITH Workshop, September 2022

The PATA Days meeting also offered the opportunity to hold a hands-on workshop on the application of Machine Learning Techniques applied

to earth sciences. This was organized by TERPRO Project EDITH. Twenty researchers from all over the world participated in the workshop, brilliantly lead by Dr. Anika Braun (Technical University Berlin). A brief theoretical introduction was followed by a practical example of data analysis.

The scholars faced the automatic recognition of landslides in a high-resolution DTM by means of a supervised classification approach. The software used during the workshop was made available by courtesy of IBM.

The next move in the last year of the running EDITH Project is to organize an in-presence meeting in Israel for 2023. The 2023 meeting will be organized with invited scientists from the INQUA community and extending this opportunity also to experts from seismic-related fields (seismology, modelists etc.). We plan to organize a three-days long field school and open workshop covering the topics of EDITH. Short courses dedicated to ECRs and DCRs will be organized during the meeting. This will favor the involvement of these researchers, providing them

practical hands-on or tutorial exercises. The topics may include practical analyses of geodetic data, structure from motion or optical correlation techniques. Provisionally, 30-40 people will participate to the meeting. Stay tuned for more news!

#### **N. Parrino, E. Srivastava** **LEMON - Project 2204** **LEMON Project** **updates**

This single-year TERPRO project is about how landscape evolution relates to tectonic and climate processes in onshore and offshore Low-Slip-Rate regions.

The group focused on areas of low deformation rates on active faults in LSRs, implying that these structures are usually elusive due to the climatic overprinting acting at similar or higher rates. We believe that such peculiar characteristics make these regions excellent natural laboratories for studying tectonic and climatic forcings. However, as our research team expands,



Group photo of the post-meeting field trip on La Bonnette pass during the PATA days 2022.

we will focus on working in high-strain rate regions and areas where landslides and tsunamis have significantly shaped the landscape.

#### 2022 RECENT ACTIVITIES:

Even throughout the challenging COVID-19 years, our network grew, and we drew more researchers to the subject we proposed. Due to this, we have welcomed two more leaders to our team: Dr Sylvia Nicovich, an ECR from the US Bureau of Reclamation (USA), and Dr Chiara Zuffetti, a second ECR from the University of Milan (Italy).

Twenty-five students enrolled in our LEMON Winter School in Palermo in January 2023, and we are confident that the number will rise significantly over the coming weeks.

We released the second circular of the "[Winter School On Active Tectonics And Climate Change Driven Landscape Evolution](#)".

Please contact Dr [Nicolò Parrino](#) (UniPa) or Mr [Eshaan Srivastava](#) (IITK) for further information on the winter school.

#### 2022-2023 ACTIVITY #1:

Mid-December is the scheduled time for an online discussion between early-career researchers and a guest speaker on LEMON's issues.

Welcoming participants in Palermo under the activities of the Landscape Evolution Marker Online

Network (LEMON project), a project developed under the umbrella of INQUA and its TERPRO commission. We organized the school into two different parts.

During the 16th and 17th of January, we will have talks by young and experienced researchers. We will also invite attendants to share research and gather helpful tips and new collaborations through Pico-Talks (a 5-minute speech followed by an interactive Q&A session).

We also plan two days of fieldwork where experienced researchers will

show crucial locations in western Sicily (the 18th and 19th of January). To date, scheduled field trips are:

- Relative sea-level changes evidence in the S. Vito Peninsula (led by Fabrizio Antonioli);
- Active tectonics and its interaction with sea level changes in South Western Sicily (led by Luigi Ferranti & Pierfrancesco Burrato);
- Archaeo-seismological evidence of historical earthquakes within the Archaeological Park of Segesta (led by Carla Bottari).

#### 2023 ACTIVITY #2

We will also arrange a session at the INQUA Congress 2023 titled "Tectonic and climate-driven landscape development a never-ending problem for modern society (thoughts from LEMON project, INQUA-AIQUA)."


#### Peribaltic Working Group - Project 2011WG

#### Peribaltic WG conference

In 2023, the Peribaltic WG conference will be held in the Ostrobothnia area, in Finland. Planned timing is 21-25 August. In this region, two adjacent regions share remarkable different glacial stratigraphy and dynamics. The Kvarken region is characterized by a highly variable geomorphology and the abraded



## Winter School On Active Tectonics And Climate Change Driven Landscape Evolution




INQUA – TERPRO commission

16 – 19 January 2023, Palermo (Italy)

Second Circular

2 DAYS OF LECTURE + 2 DAYS OF FIELD TRIP



**Registration fee:** 200 Euro  
**Registration Link:** <https://forms.gle/nvzsqwAVDScbPr159>


Winter school related with **Session 176 of INQUA Rome 2023 congress:**

*"Tectonic and Climate-driven Landscape Evolution a never-ending challenge for modern society (Thoughts from LEMON project, INQUA - AIQUA)"*

**Abstract Submission deadline: 28/11/2022**

**Venue:**  
 G.G. Gemmellaro Geologic Museum  
 Corso Tukory 131, Palermo

**For any queries contact:**  
 Nicolò Parrino: [nicolo.parrino@unipa.it](mailto:nicolo.parrino@unipa.it)  
 Eshaan Srivastava: [eshaan@unipa.it](mailto:eshaan@unipa.it)



**Lecture general topics**

- Morpho-depositional coastal and offshore climatic signature.
- Remotely sensed shoreline evolution, a proxy for climate change?
- Relative sea level change from 1.5 Ma using geomorphological, biological, sedimentological, and archaeological markers.
- Coastal geomorphic markers and active faulting.
- Geochronological insight on tectonically forced Landscape Evolution
- Paleoseismic and Paleotsunami studies from Andaman and Nicobar Islands.
- Active tectonics in low deformation rate regions: insight from multidisciplinary approaches.

**Travel and accommodation grant:**

Applications for students, Early Career Researchers, and Developing Countries Researchers should contain:

- One page CV;
- Short motivation letter (max.10 lines);
- Travel and accommodation expenses;
- Required support (short budget);
- Additional funding availability.

It should be uploaded in one PDF file in the registration link.

**Organized by:**

- INQUA – TERPRO commission.
- Department of Earth and Marine Sciences, University of Palermo.
- Istituto Nazionale di Geofisica e Vulcanologia.
- Indian Institute of Technology Kanpur.
- Associazione Italiana per lo Studio del Quaternario.

rock surfaces with crossing striation sets represent at least 4 different ice flow stages. Based on those two main elements a unique glaciogenic features of the core area of Fennoscandian Ice Sheet (FIS) has been formed. It is remarkable that this area is surrounded by the glaciated terrains indicating large passive ice sheet areas with old and complicated sediment sequences, and on the other hand, pre-glacial weathered bedrock surfaces and remains of old sedimentary rocks proposing limited glacial erosion through the Pleistocene. Furthermore, deep basin in the west accelerated ice flow velocities and subglacial erosion.

Study of those areas predominantly propose us better understanding of the ice sheet dynamics in the central part of FIS.

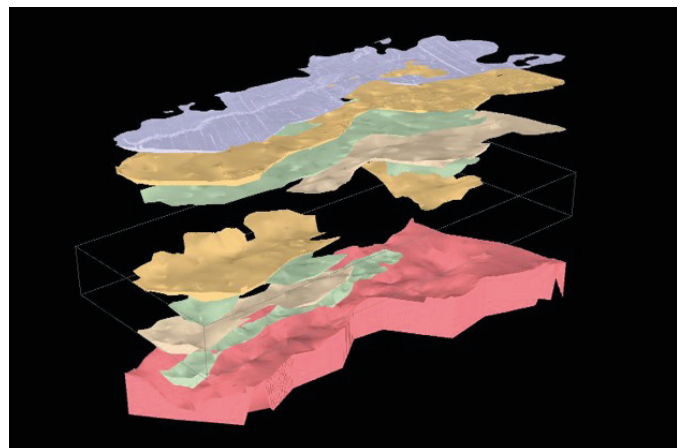
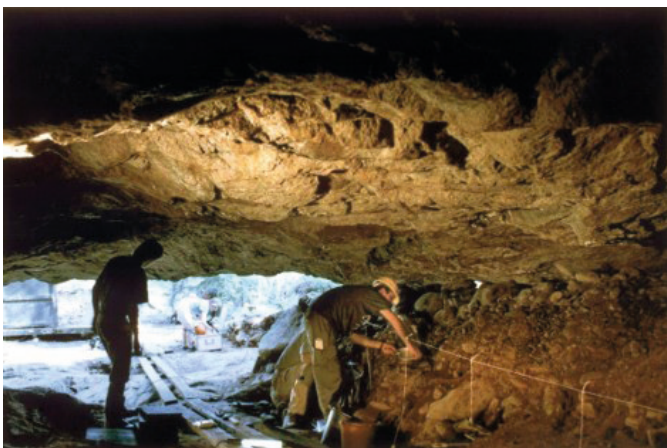
**J. McCalpin**

**TERPRO at the INQUA congress**

TERPRO is sponsoring 42 Proposed Sessions, of which 14 are in neotectonics and the other 28 are in terrestrial processes and Quaternary geology. Project TPPT is sponsoring the first-ever Discussion Panel at an INQUA Congress (Session 34: *Discussion Panel on Assessing Fault*

*Capability in Different Geodynamic and Environmental Settings; L. Serva, P.M. Figueiredo, A. Sarmiento, L. Bonadeo*). Determining if a fault is capable of producing surface-rupturing earthquakes is a key component to estimate seismic hazard. The methods, criteria, and challenges in assessing fault capability can vary depending on the tectonic rate for each region. This session aims to discuss and compare those methods in different geodynamic domains.

TERPRO will also be sponsoring a Short Course on Landslide Science.



Locations and topics of the Peribaltic WG conference in Ostrobothnia, Finland

# INQUA Roma 2023

## Updates: abstracts, field trips, workshops



### ABSTRACTS AND PARTICIPATION

The abstract submission close at December 1st. We are glad to announce that almost 4000 abstracts from 102 countries have been submitted to more than 200 conference sessions! The next steps to select the sessions that will be available at the Congress is ongoing, and you can expect some news in the next weeks.

Registration is now open on the [INQUARoma2023](https://www.inquaroma2023.com) website. Early Bird registration to the congress and registration to Field Trips, Workshops and Short Courses will be open until 20th February 2023.

### FIELD TRIPS

A diverse array of Field Trips is being organised for delegates and accompanying persons. Field Trips will be held

in Italy and in some other Mediterranean Countries. Field Trips will run both prior to and after the XXI INQUA Congress. Please consider that we will be in full tourist season especially after the Congress so that the number of pre-Congress fieldtrips is greater than post-Congress. There will also be various one-day mid-congress trips on Sunday 16 July, both in Rome and its surroundings.

The deadline for fieldtrip registration is 20 February 2023. The cancellation policy due to possible Covid restriction will be the same as that of the Congress registration (full reimbursement if due to travelling limitation). If you have any queries regarding the Field Trips, please [contact us](#).

You can find [infos and videos](#) on some of these important Quaternary locations on the INQUARoma2023 website.

## PRE-CONGRESS FIELD TRIPS

**PRE-1- Late Pleistocene-Holocene uplift and active tectonics at the southern margin of the Central Anatolian Plateau (Southern Turkey)**[Cosentino et al.](#)

The Central Anatolian Plateau (CAP) underwent 1.5 km of rock uplift starting from the Middle Pleistocene. Participants will visit the uplifted Lower and Middle Pleistocene deep marine deposits at the southern margin of the plateau (Gülınar District). The Middle Pleistocene coastal onlap at ca. 1500 to 1600 m a.s.l. points to a mid-term uplift rate of 3.21 to 3.42 mm/yr. Coeval marine deposits of the Aksu (100 m a.s.l.) and Manavgat (60 m a.s.l.) basins are evidence of strong differential uplift between the CAP southern margin and the Antalya region. A staircase morphology of marine terraces extending from the topmost part of the Gülınar area down to the Mediterranean coastline is the result of rock uplift and sea level highstands for the last 500 kyr. The field trip will move toward the Mediterranean coast of southern Turkey where notches, abrasion platforms, beach rocks, river outlets, and archeological remains testify that the differential uplift in southern Anatolia is still going on. Participants will have the opportunity to observe some extensional faults affecting Holocene markers. The field trip will end in Elaiussa-Sebaste, an ancient Roman city, where the harbor and other archaeological remains show late Holocene uplift rates of ca. 1.2 mm/yr

**PRE-2- Late Quaternary landscapes and palaeoenvironments through the Mediterranean and the Alps**[Ollivier et al.](#)

The southern France shows a wide variety of landscapes and biotopes, from Mediterranean Sea to the Alps. The Late Quaternary bioclimatic changes were well recorded in

calcareous tufa, alluvial formations and paleosoil, scattered from thermo-mediterranean to oro-mediterranean zone. Sequences were investigated through the prism of paleoecological (terrestrial gastropods, charcoal, botanical remains), geomorphological (morphosedimentary and stratigraphic organization), sedimentological (physico-chemistry and carbonate faciology) and chronological ( $^{14}\text{C}$ , U/Th dating) studies. Participants will visit MIS-3 (50 Ka to 26 Ka) paleosoil and Postglacial (16 Ka-1 Ka) tufa from Provence showing the environmental changes linked to interglacial/interstadial episodes and Neolithic human impact on sensitive Mediterranean biotopes. The field trip will move along the Durance River valley toward the first alpine relief to see alluvial terraces (sedimentation rates and trends) and tufa deposits reflecting the Holocene biodiversity through leaf imprints and palaeoecological studies. In addition, they could also observe the plio-pleistocene boundary recorded in calcareous tufa affected by neotectonic. Participants will complete this Quaternary palaeobiogeographic tour by climbing the western Alps to see a geo-botanical sequence dealing with Holocene climate and timberline position around 9800 BP

**PRE-3- Pleistocene slope, shallow-marine and continental deposits of eastern central Italy wedge-top basin: a record of sea-level changes and mountain building.**[Di Celma et al.](#)

The central portion of the Periadriatic basin is a N-S oriented foreland basin system associated to the Central Apennine Outer Orogenic Wedge. This system stretches along the Marche and Abruzzi regions and is an excellent example of an evolving mountain chain and associated deep-marine to fluvial-alluvial foredeep and wedge-top basin system. This three-days trip has been designed to provide an overview of the stratigraphic architecture and evolutionary steps of the basin by integrating



Map of the pre-congress field trips.

surface and subsurface datasets. It affords a fine west to east transect through the Pleistocene basin fill in southern Marche, where exposures allow a close examination of sedimentary facies and architecture of depositional systems. The basin fill succession includes coarse-grained submarine canyon fills deeply incised into slope mudstones, mixed gravel and sand beach deposits and alternating gravel and silt-clay bodies interpreted as fluvial-channel and floodplain deposits, respectively. The analysis of facies architecture and discontinuity surfaces will allow the attendees to understand the relative role of climate, sediment supply, and thrust front propagation inside the foreland basins system as several factors controlling the stratigraphic record

**PRE-4- Life with geohazard at the contact of the Alps, the Dinarides and the Pannonian Basin.**

[Jamšek Rupnik et al.](#)

The life at the contact of the Alps, the Dinarides and the Pannonian Basin has been influenced by the geohazard phenomena since the man appeared here (and much earlier). On the other hand, the glaciers, tectonics, earthquakes, flood plains and massive mass wasting events also give this area its appealing looks. The fieldtrip will have stops in western Slovenia (flooding of the karst poljes in Notranjska, recent and fossil slope deposit phenomena in the Vipava Valley, glaciation, active tectonics and mass wasting in the Soča Valley), Carinthia in Austria (mass wasting with special emphasis on rock avalanches and their impact on landscape and society exemplified by a medieval earthquake-triggered case close to Villach), central to SE Slovenia (past and potential future debris flows in the area of the Koroška Bela settlement, environmental changes and earthquakes recorded in Lake Bohinj, Sava and Vodice faults causing earthquake hazard in the Ljubljana Basin, fluvial sediments and tectonics of the Krško Basin) and in NE Croatia (seismotectonics and recent large earthquakes in Zagreb and Petrinja with their environmental effects).

**PRE-5- Palaeolithic Cave deposits and Karst evolution in the Venetian Pre-Alps.**

[Peresani and Sauro](#)

Human evolution, palaeolithic caves and karst landscape are the key topics of this excursion offering the opportunity to visit the Monti Lessini, the Berici Hills and two of the most important stratified palaeolithic sites in the Eastern Italian Pre-Alps and Alpine foreland. Monti Lessini is a mountainous area with a distinct physical landscape related to the tectonic evolution and fluvial, karst and periglacial morphogenetic processes. This pre-alpine area is rich in natural archives preserved in karst cavities which are also a reference for investigations on human-ecological relationships of Neanderthals and first Homo sapiens, their settlements and material culture. At Grotta di Fumane, deposits explored by multidisciplinary research represent exceptional evidence of fundamental importance for the study of life and the spirituality of a past humanity that roamed this part of southern Europe for over 50,000 years. The second part of the excursion aims to illustrate the fluvio-karstic landscape of the Berici Hills, a plateau with uneven topography with peaks, sink-holes, palaeosols and caves like Grotta San

Bernardino. This is another key site which preserves a Middle and Late Pleistocene stratigraphy recording an ensemble of climatic cycles and evidence of Neanderthal use of the cave and landscape resources in different ecological conditions.

**PRE-6- Large landslides, climate changes and human impact in the Italian Dolomites since the Lateglacial.**

[Soldati et al.](#)

The field trip will take place in the Italian Dolomites. Here, the outstanding scenery of the calcareous mountains meets with the slope instability. Several landslides and related deposits were dated from the Lateglacial to present, clustering in different periods. The first phase is observed in the Preboreal and Boreal and includes both translational rock slides, which occurred following the withdrawal of LGM glaciers, and rotational slides and flows, probably favoured by high groundwater levels due to an increase of precipitation and/or permafrost melting. A second concentration of landslide events occurred during the Sub-boreal, when mainly rotational slides and/or flows occurred. Finally, some historical events occurred, including huge rock avalanches. Climate degradation, seismic shakings and human activity played a role in the occurrence of such events, contributing to the rock mass instability or acting as triggers. We will visit both the location of huge historical events (i.e., the Vajont landslide and the Masiere di Vedana rock avalanche), and the places where recurrent mass movements occurred as a response of climatic events (i.e., Cortina and Badia areas) and seismic shakings (i.e., Lavini di Marco site). Discussion on triggering and predisposing factors will be proposed, paired with direct observations of the deposits' main features and the introduction to the geological and structural settings of the areas.

**PRE-7- The Bradanic Trough: stratigraphic response to subsidence, shortening and uplift of the Quaternary south-Apennine's foreland-basin.**

[Tropeano et al.](#)

Aim of the field trip is to discuss the south Apennines Quaternary foredeep evolution showing stratigraphic and sedimentologic features of practically undeformed to tectonized successions cropping out in some selected areas of the Basilicata Region (southern Italy). The first day (10 July 2023), moving from Bari to Matera, we will cross from E to W the Apulian Foreland looking out the Bradanic Trough (the Quaternary south Apennines foreland-basin). We will apply sequence stratigraphy principles observing the response of Quaternary carbonate systems to a severe foredeep subsidence. The second day (11 July 2023), we will move from Matera to the chain front (Acerenza), to discuss sedimentology and stratigraphy of Quaternary tide-influenced systems developed on moving thrusts (wedge-top area). In the afternoon we will move to Genzano di Lucania, where coarse-grained deposits represent the oldest undeformed deposits of the top of the Bradanic Trough (end of shortening?). The third day (12 July 2023), we will move from Matera to the Sant'Arcangelo Basin, the widest Quaternary satellite basin of the south Apennines foreland-basin system. Growth structures affecting the basin and the sedimentary response to tectonics

will be the main topics of the day.

The fourth day (13 July 2023) we will move from Matera to Grassano, where the village was built inside and on a very small Gilbert type delta ("I Cinti" locality). A panoramic view from the chain front to the Ionian Sea will lead us to discuss about the middle-late Quaternary uplift-related staircase of terraced marine deposits developed in the hinterland of the Taranto Gulf. In the late morning we will move to Rome by bus.

**PRE-8- LGM and Lateglacial at the southern end of the Alps (Maritime Alps).**

[Ribolini et al.](#)

The field excursion focuses on the main terminal moraines of the Last Glacial Maximum (LGM) and the Lateglacial phases at the southernmost edge of the Alps, i.e. the Maritime Alps. The morphological characteristics of the moraines will be shown, framing them in the palaeoglaciological reconstruction of the individual valleys and in the chronological context of the Alpine stadials. The main sites that have returned the chronological constraints (surface exposure ages) of the LGM, and of Lateglacial stages (e.g. Bhull, Egesen) will be visited. The field excursion will cover the frontal moraines of the LGM and the Lateglacial phases of the Valle Stura di Demonte, Valle Gesso and Valle Vermenagna. During the field excursion, reconstructions of the glacial palaeoshapes will also be shown so that participants can appreciate their consistency with the glacial landforms evident in the landscape. Finally, the palaeoclimatic conditions estimated through palaeoglaciological methods will allow us to appreciate how the geographical position (proximity to the Mediterranean Sea, latitude, local atmospheric circulation) may have guided the glaciation style in this alpine sector where, to date, the southernmost glaciers of the Alps exist

**PRE-10- Palaeogeographical evolution of the Egadi Islands (western Sicily, Italy). Implications for Late Pleistocene and Early Holocene sea-crossings by humans and other mammals.**

[Antonoli et al.](#)

The continental shelf morphology offshore of western Sicily suggests that during the Last Glacial Maximum (LGM, 21 ka cal BP), two of the Egadi Islands, Favignana and Levanzo, were connected to Sicily by a wide-emerged plain, while Marettimo was only separated from the other islands by a narrow channel. During the Holocene Levanzo and Favignana become islands at different times. Fieldtrip presents geomorphological and paleontological contents together with the Homo sapiens colonization and navigation in the Mediterranean. The chronological range of what will be illustrated (on field) range between 300 and 7 ka BP

**PRE-11- Active Tectonics, Earthquake Geology, Palaeoenvironment and Quaternary sequences: A transverse along the Corinth Gulf Rift to Zakynthos Island.**

[Papanikolaou et al.](#)

The Corinth Gulf is one of the fastest extending regions worldwide (~15mm/yr), forming a spectacular setting for studying active faults and Quaternary sedimentary sequences. The fieldtrip will initiate from the eastern part of the Gulf

focusing towards the South Alkyonides Fault system that was activated during the 1981 earthquake sequence. Fault scarps, surface ruptures, trenches, wind-gaps, marine terraces and Holocene notches deformed by active faults will be visited along the Perachora Peninsula. We will cross the Corinth Canal by boat, focusing on the interaction between the tectonic movements and the paleoenvironmental changes based on outcrop and borehole data and visit the ancient Kechriaie submerged harbour (famous due to Apostle Paul visits and texts). We will examine the relationships between active faults, marine terraces, present-day fan deltas and paleodeltas along the southern central and western part of the Gulf. We will observe how climatic cycles are imprinted on the sedimentary processes and the geomorphology. The fieldtrip will end up in Zakynthos island, where due to tectonic uplift, a spectacular Early-Middle Pleistocene (2.6 - 0.6 Ma) marine sedimentary sequence outcrops. The sequence includes unconformities that relate to sea level lowstands, whereas biostratigraphy and magnetostratigraphy document major boundaries such as the Jaramillo, the Cobb Mountain, the Olduvai and Brunhes

**PRE-12- Santorini island (Greece): four days in a volcano.**

[Nomikou et al.](#)

Santorini volcano is a unique scientific natural laboratory because it preserves important evidence of geological, archaeological and paleontological remains of the Minoan plinian eruption, which took place in the Late Bronze Age. The eruption is famous for its impact in the demise of the Minoan civilization of Crete and on the Bronze-Age Mediterranean world in general. It comprised four phases, producing "plinian" pumice in the first phase, phreatomagmatic pyroclastic surges in the second and third phase and subaerial flows in the fourth phase. It generated at least 50m-thick cover of pyroclastic deposits on Santorini and left behind the spectacular caldera seen today. The post-Minoan active volcanic islands of Kameni (last eruption in 1950) occur at the centre of the caldera. The prehistoric town of Akrotiri, an archaeological site that has been called the "Pompeii of the ancient Aegean" was blanketed with thick deposits of tephra of the Minoan cataclysm eruption. Within the excavated area of the city 35 buildings have been identified so far. The caldera walls and the Kameni islands will be visited by boat.

**PRE-13- Quaternary glacialism of the Aosta Valley: a transept from the Ivrea end moraine system to the Monte Bianco Massif.**

[Gianotti et al.](#)

The Aosta Valley is a wide branched mountain basin in the Italian Western Alps, bounded by some of the highest peaks in Europe, where glacial, periglacial and gravitative landforms are widespread. We'll focus on glacial deposits and forms, starting from the Ivrea Morainic Amphitheatre dating back to all the Pleistocene glaciations. Its main lateral moraine (Serra di Ivrea) is the biggest of the Alps. Light mountain trips (trekking items are required) will be alternated to the visit of the Lateglacial stadial sites in the valley floor (eg. Fenis) and of Holocene/LIA apparatus (Cervino and Miage). High mountains will be visited very closely (Mont Cervino by cableway to Plan-Maison at 2550 m; Mont Blanc by Skyway at 3466 m). The

overnight stay in a hut will allow us to see the interactions between glacial modeling and a large DSGSD at Vetan, the oldest archaeological site in the region (Mesolithic) and a very exemplar doubled ridge (Becca France), from which a rock avalanche broke off that destroyed the village of Thora in 1564 AD. Participants will enjoy the history and architecture from Roman (Bessa gold placer dumps, Donnaz road, Aosta town, bridges) to Medieval (castles and churches) and Modern age (Ivrea industrial city, Unesco World Heritage)

**PRE-14- A tour through volcanology and archaeology at the Neapolitan volcanoes.**

[\*Petrosino et al.\*](#)

The field trip aims at illustrating the close relationship between volcanology and archaeology at Somma-Vesuvius and Campi Flegrei (Southern Italy). The tour starts in Naples, where the geologic setting of Campi Flegrei will be shown together with the Neapolitan Yellow Tuff volcanic deposits, in which starting from Roman times a net of astonishing subterranean galleries was carved with different purposes and uses. During the second day at Pozzuoli the products of the Campi Flegrei activity of the last 15 ka, occurred at more than 70 volcanic monogenetic vents and mostly related to phreatomagmatic eruptions, will be shown, together with the most important archaeological remains of the area, as the Serapis Temple, testimony of the bradyseismic activity. The last two days will be spent at Somma-Vesuvius, and comprise the visit to the summit area of the volcano, where the spectacular features of the inner rim of the Somma caldera with the Vesuvius cone grown inside can be observed and discussed. During the last part of the field trip the visit to several archaeological sites buried by both the famous 79 AD eruption and the protohistoric activity of the volcano is planned.

**PRE-15- Geology, Geomorphology in active zones, Archaeology in active zones.**

[\*Doumaz et al.\*](#)

An active Fold-Faulted structure offers so many patterns for very didactic readings of geomorphic evidences of an active zone capable of very violent earthquakes. Fold, blind fault, marine terraces, erosion, hydrography, tilted deposits, Archaeological site and many other parameters that lead to almost smell the active tectonic. The structure is very close to Algiers and constitutes a huge danger. Along the trip we will have many stops to show and explain things that are often invisible to an unexperimented observer in such active compressional zones. We will go on the top of the fold and show the two environments that interact with this active fold, The coastal zone with typical marine terraces, archaeological proofs of a still active structure and many more on another side the continental southern zone that shows different neo-tectonic patterns such as a frontal sedimentary basin that records all the tectonic history.

**PRE-16- MIS 5, Relative Sea-level, U/Th dating, Cave stratigraphy, Archaeology.**

[\*Isola et al.\*](#)

Last Interglacial (MIS 5e, 129-116 ka) sea level highstand has left important geomorphological and sedimentary evidences

along the Tyrrhenian coast, like marine caves, which have represented sites for human occupation after the termination of sea invasion. The geomorphological features and the sedimentary infilling of these caves represent an unique record of information on relative sea level variations during the last 150 kyr and represent impressive archives of human occupation yielding important archaeological remain from the Middle-to-Upper Palaeolithic, which, in some cases, includes exceptional human remains. During the field trip will be visited some of the classical Quaternary caves in the Monte Circeo near Rome, including the Grotta Guattari, which recently yielded an impressive collection of Neanderthal remains, and Grotta della Capre, which provided important chronological constraints for the termination of the MIS 5e highstand. The trip will then move to Marina di Camerota, famous for the important Lower to Upper Palaeolithic cave stratigraphic successions and for the recent chronological constrains for the MIS 5 relative sea level obtained in the Baia di Infreschi on speleothems and tephra markers. The field trip will finally move along some of the most spectacular beaches of the Tyrrhenian coast, inviting to some short period of rest.

**PRE-17- Palaeosols across the N. Apennines: insights into the Late Quaternary dynamics of an active orogen.**

[\*Andreetta et al.\*](#)

The Northern Apennines chain is an active orogen developed in a continental collisional setting. During the Quaternary active tectonics, climate fluctuations, and sea-level change left a clear imprinting on the regional geomorphology and the surface geology. Examination of stratigraphically correlated palaeosols within alluvial and coastal clastic successions occurring on both sides of the chain, i.e. on the active front (Northern slope) and the back-arc area (Tuscany), provide fine detail to reconstructions of the orogen dynamic during the Quaternary. Examples of dated and correlated palaeosols within their, morpho-structural, stratigraphic, and sedimentological context, will be presented and discussed on the Northern side of the chain (Ghiardo plateau, in the picture) and in the coastal Tuscany (Baratti gulf). In the transfer from the northern slopes to the back-arc area, selected stops in the Pleistocene fluvio-lacustrine Mugello basin will provide a sight into the morpho-stratigraphic architecture of an intermontane basin developed in the axial portion of the Northern Apennines.

**PRE-19- The Middle Pleistocene to Early Holocene of southern Apulia (southern Italy).**

[\*Sardella et al.\*](#)

The Salento peninsula (southernmost part of Apulia, Italy) is an area of great importance for the understanding of palaeoenvironmental changes that have occurred in the Mediterranean region at the end of the Pleistocene and the ecological dynamics (Homo-fauna and environment interactions) in what can be considered a refugium area for many species during the cold climate phases. The excursion includes the visit of several cave deposits, including Grotta Romanelli, located on the coasts of Sothern Apulia. Grotta Romanelli, with its Middle Pleistocene-Early Holocene archaeological and fossiliferous deposits, is one of the key sites for the study of Italian prehistory. It was among the

first sites in Europe where scientific methods were applied in the field and for decades has been a strong reference for the stratigraphy, prehistory and palaeontology of Mediterranean Europe. Geomorphological, archeological and paleontological data from Grotta Romanelli and other coastal cave infilling deposits of Salento Peninsula are of considerable interest for the reconstruction of the Mediterranean terrestrial ecosystem evolution during the last 300 thousand years. Finally, the visit of the Archeological and Paleontological Museums of Salento Peninsula allows to see part of the remarkable number of fossils and artefacts recovered during the historical excavations

#### POST-CONGRESS FIELD TRIPS

##### POST-1- Active tectonics and major seismicity in Central Italy.

[Gori et al.](#)

Central Italy is affected by a number of normal faults, manifestation of the extensional tectonic regime affecting the Apennine chain. Normal fault activity throughout the Quaternary caused the formation of intermontane tectonic depressions hosting continental deposits, which geologically "recorded" long and short term fault movements. Central Italy major seismicity, both historical and instrumental, characterized by earthquakes with magnitude of up to 7, is related to the activation of some of the major active normal faults. Examples of this are earthquakes that in 1703 (M 6.9) and in 2016 (M 6.5) struck a vast area of the central Apennines causing widespread destruction. These events also caused a plethora of environmental effects, among which metre-scale surface faulting, whose traces are still visible in the landscape. The field trip will bring the participants in the Norcia basin, affected by the fault responsible for the 1703 event. The geological evidence of late Quaternary activity of the fault will be show as well as the traces of its late Holocene activation events. Then, the field trip will move just east, along the Mt. Vettore fault, that nucleated the 2016 earthquake, to show the participants the evidence of surface faulting occurred along the structure.

##### POST-2- When tectonics and climate take over: Quaternary depositional history of extensional Tuscan basins.

[Bertini et al.](#)

The investigation of the tectono-sedimentary history of extensional basins and of their infill is a key-study to understand role in providing and maintaining the sinks into which sediments can be delivered due to the complex interaction among eustatism, climate and tectonics. During



Map of the post-congress field trips.

Quaternary, due to their location in the internal portion of the Northern Apennines, extensional Tuscan Basins have recorded thick sequences of continental sedimentation that has been strongly controlled by tectonic, volcanism and climatic processes. In this view such Basins are able to illustrate a detailed record of Quaternary climatic changes and tectonic leading significant changes of such portion of the Apennine Mountain range. Spectacular examples of this interaction during the last 3 Ma will be illustrated in different depositional systems (fluvio-lacustrine - Valdarno Basin; volcanic - Mt. Amiata Volcano; travertines - Rapolano Terme and Bagni San Filippo). All the field trip is nestled in the historical and scenic view of the Tuscan landscape.

##### POST-3- Glacial history of Croatian Dinarides.

[Ljerka Marjanac et al.](#)

Long-term investigation revealed sedimentological evidence of an extensive glaciation of the Croatian part of Dinarides (eastern Adriatic coast and islands). Maximum glacial advance occurred during Middle Pleistocene as documented by U-series dating of calcite cements taken from glacial deposits, which provided minimum age of over 350 ka. Glaciers must

have descended from a large ice cap, and they reached areas below the present sea level. The excursion route will track remarkable evidence of such extensive glaciation, though it is hard to imagine that the present-day beautiful seaside places have once been under thick ice. Unique locations will be visited to observe various sedimentary features related to subglacial and proglacial environments, specifically at the 3 km long Novigrad Sea coastal section. The Karin Sea coastal section displays subglacial deformations caused by glacial advance. Seline coastal section displays the oldest glaciogenic sediments, a transition from glaciodeltaic to glaciolacustrine. Glaciotectonized lacustrine sediments composed of clastic varves and with diverse fossil flora will be observed at Ždrilo site, the only one of this kind in Croatia. The type locality of the mega-diamict facies, specific evidence of Middle Pleistocene glacial extent, will be visited in the Paklenica National Park. All sites on the field tour represent the valuable glacial geoheritage of the Mediterranean

#### **POST-4- LGM glacial and glaciofluvial environments in a tectonically active area (southeastern Alps).**

[\*Monegato et al.\*](#)

The field trip will take place along the southeastern Alpine foothills, from the outlet of the Piave River to the Tagliamento end moraine system. This area was interested by the spread of the piedmont lobes of the Piave and Tagliamento glaciers during Pleistocene glaciations. The stratigraphic successions of the end moraine systems and outwash fans and megafans yielded important information about the development of Alpine glacier lobes and their interaction with local catchments. The outermost Alpine mountain ranges also hosted local independent glaciers, which provided important paleoclimate information on the LGM. The area belongs to the Plio-Quaternary active front of the eastern Southern Alps, a polyphase S-SE-verging fold-and-thrust belt in activity since Middle Miocene onward. Active faults of the front of the eastern Southern Alps displaced older Pleistocene successions and created small local basins of lacustrine/palustrine environments. Some destructive earthquakes (Mw 6.0-6.5) took place in the last Millennium and recurrent historical tectonic activity of the external front was testified by paleoseismological investigations.

Participants will have the possibility of visiting key stratigraphic sites and discuss the peculiar interaction between major glaciations and tectonic activity in shaping this scenic landscape and in defining local sedimentary basins.

#### **POST-5- The Quaternary evolution of Sulmona basin, central Italy.**

[\*Giaccio et al.\*](#)

The Quaternary tectonic basin of Sulmona, central Italy, hosts a unique, tephrochronologically well-constrained, lacustrine-fluvial sedimentary succession of the Pleistocene, discontinuously spanning through MIS 21-MIS 3 (810-30 ka).  $\delta^{18}\text{O}$  isotopes analyses of the carbonate from different stratigraphic intervals of the Sulmona sedimentary successions, including MIS 19-18, MIS 12-11 and MIS 5, indicate a strong Mediterranean-North Atlantic climate teleconnection characterized by a close phase relationship between temperature change in North Atlantic

and hydrological variability in Mediterranean regions. Particular relevant is the interval recording the Glacial Termination IX and the MIS 19 period, the best orbital analogue for the Holocene, which also document the increase of the  $^{10}\text{Be}$  related to the Matuyama-Brunhes geomagnetic reversal, whose abrupt termination is here precisely dated by  $^{40}\text{Ar}/^{39}\text{Ar}$  method at c. 771 ka. During the field trip, the participants will be introduced to the general tectonic and sedimentary evolution framework of the basin with specific focuses and stops on the sections <documenting the paleoclimatic, paleomagnetic and  $^{10}\text{Be}$  records of the MIS 19, MIS 11 and MIS 5 periods

#### **POST-6- Drainage system adjustment in response to the opening of the Rieti intermontane basin.**

[\*Fubelli et al.\*](#)

The Fara in Sabina Mts. are made of deformed Mesozoic limestone and marls in transitional facies between the Abruzzi platform and the Umbria- Marche pelagic basin. Along their slope, at elevation ranging between 260 and 277 m a.s.l. several holes of lithodomus mark the highest part of the Gelasian in age marine transgressive phase. In particular, the uppermost paleoshorelines (UPS) are related to marine and transitional deposits belonging to the Chiani-Tevere Formation. Few kilometres north of Fara in Sabina Mts, deposits made of sands, marls, clays and some lignitiferous horizons are heteropic with the Chiani-Tevere Fm, very close to its uppermost paleo-depositional surface. This surface defines the alluvial plain of the PaleoFarfa River, correlates the sea level markers of the UPS from the west at 270 m a.s.l. and is recognizable as far as in the Rieti area. This ancient top gelasian surface (made of fluvial to alluvial fan deposits) is deeply incised by the Middle Pleistocene river erosion in the Fassinoro area. Contextually, in the Rieti area is abruptly interrupted by E-W normal fault that border southward and northward the Rieti basin. Before the formation of the Rieti Plain, subsidence was concentrated more to the south, as suggested by the spatial distribution of the Gelasian alluvial body thickness

#### **POST-7- Quaternary archives in the Northeastern Adriatic karst environments.**

[\*Furlani et al.\*](#)

The Classical and Istrian Karst are situated at the north-easternmost sector of the Adriatic Sea, in Italy, Slovenia and Croatia. The fieldtrip will focus both on continental and marine deposits and archaeological sequences that were used to reconstruct the Quaternary geological history of the area, from the Gulf of Trieste to the Istrian peninsula. To discuss the Quaternary evolution of the area, several sites will be visited, such as the "Riparo di Visogliano" (Middle Pleistocene), Pupičina cave (Late Pleistocene to Holocene) and relict cave Račička pečina (Pliocene to Holocene), where studies helped to detect regional uplift and geomorphological evolution of the area, the Mirna river, loess deposits in val Rosandra and Istria, some archaeological sites, such as the submerged Roman Age docks at Muggia.

#### **POST-8- Holocene marine and lake landscapes of Dalmatian National Parks Krka and Kornati.**

[\*Slobodan et al.\*](#)

The boat field trip encompasses two National Parks – Krka and Kornati, and Nature Park Telašćica in central Dalmatia. During the field trip we revisit the Quaternary paleoenvironments and geomorphological features of the area.

The Quaternary fluvial record of Krka river is an unique karst environment with a 46 m high system of Holocene tufa barriers, waterfalls and lakes and the remains of Eemian tufa barriers that tower 20m above the Holocene barriers. The excursion will illustrate the morphology of the Skradinski buk tufa barriers and the Visovac lake depression. Downstream from Skradinski buk are submerged tufa barriers and lakes that formed during the early Holocene and which due to the Holocene sea-level rise, the barrier system was gradually submerged.

The outer rim of the islands in the NP Kornati and Telašćica exhibits up to 100 m high tectonic escarpment that extends deep below the present sea level (-90 m) and forms one of the most spectacular features of the karstified eastern Adriatic coast. The karst geomorphology enabled the formation of different Quaternary paleoenvironments that have also been submerged due to the Holocene sea level rise. We visit marine lake Mir that is the modern analogue of the environments that formed prior to the marine flooding of isolated karst basins. The field trip covers the topics of karst Fluvial and Lake environments, Coastal and Marine Processes, Paleoclimate, lateglacial sea-level rise.

#### **POST-9- Messinian/Zanclean, Zanclean/Piacenzian and Piacenzian/Gelasian GSSPs in Sicily.**

*Caruso et al.*

The Eraclea Minoa section, located on the SW coast of Sicily is probably one of the most famous section for the study of the Messinian Salinity Crisis. It provides a complete sedimentary record from the onset of the MSC up to the restoration of the normal marine conditions and contains the Messinian-Zanclean GSSP.

The Capo Rossello area represents one of the most beautiful and complete sedimentary successions of upper Messinian to lower Pleistocene. At Punta Piccola section the Zanclean/Piacenzian GSSP is present. Hilgen (1991a; 1991b) proposed an Astronomical Time Scale (ATS) for the whole lower-middle Pliocene.

The area of Monte San Nicola [MSN], located few km NW of Gela (Fig. 29-31), hosts extensive outcrops of Pliocene and Pleistocene marine and the Gelasian GSSP is defined at the sapropel Nicola Bed.

#### MID-CONGRESS FIELD TRIPS

#### **MID-1- Late Holocene sea-level changes and the Roman fish tanks (Civitavecchia).**

[\*Anzidei and Enei\*](#)

The fish tanks of Punta della Vipera and Castrum Novum are located between Civitavecchia and Santa Marinella, at about 1 hour by car from Rome. These astonishing fish tanks shows a series of basins characterized by architectural features bearing with past sea level. Recent studies have shown that instrumental records indicate that ocean volumes during the 20th century have increased so as to raise eustatic sea level by 2 mm/year and the few available records suggest that this

is higher than for the previous century. While geological data indicate that ocean volumes have increased since the main phase of deglaciation about 7000 years ago but whether this continued into the recent past remains unclear. The above analysis has been important for establishing whether the recent rise is associated with global warming or is part of a longer duration non-anthropogenic signal.

Archaeological evidence from Roman age fish tanks provide a precise measure of local sea level of at 2000 years ago. Part of this change is the result of ongoing glacio-hydro isostatic adjustment of the crust subsequent to the last deglaciation. A comparison with tide-gauge records from nearby locations and with geologically constrained model predictions of the glacio- isostatic contributions establishes that the onset of modern sea-level rise occurred in recent time at 100±53 years before present. The field trip, besides the geoarchaeological description, includes a guided swimming tour into the pools to discover the hydraulic features of this maritime structure. It is recommended to bring mask, snorkel, underwater camera, sunscreen and towel

#### **MID-2- The INGV National earthquake center.**

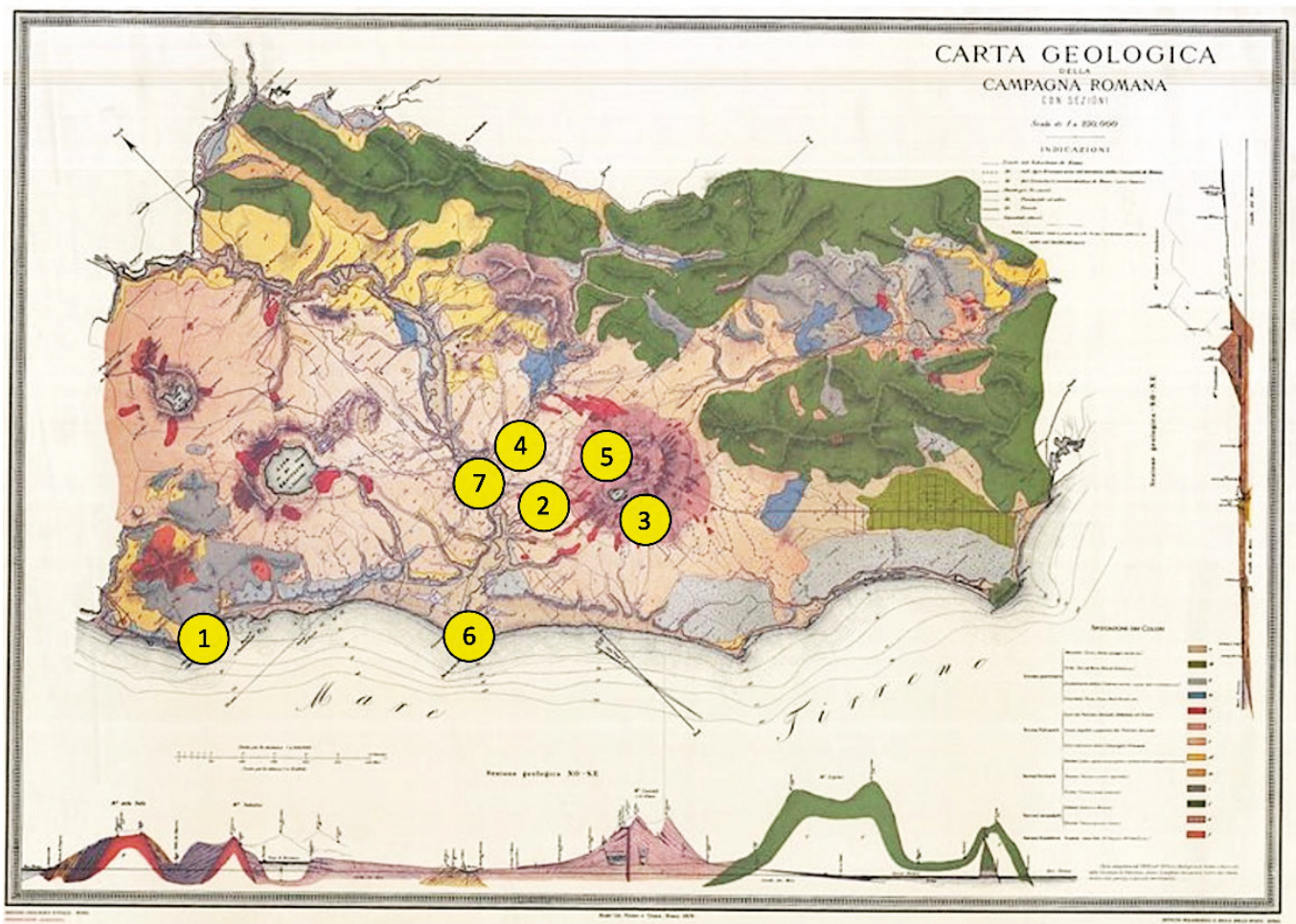
[\*Anzidei and Stramondo\*](#)

The National Institute of Geophysics and Volcanology (INGV) pursues the objectives of observing phenomena and developing scientific knowledge on the Earth System as a whole. This occurs in strong interaction with technological activity, the management and development of research infrastructures and the implementation of activities with a potentially significant impact on the population and on the various components of the Company. The INGV is an operational structure of the Italian National Civil Protection Service and carries out seismic, tsunami and volcanic monitoring and surveillance in the Italian territory and in the Mediterranean area. The primary objective of the INGV is to contribute to the understanding of the dynamics of the Earth System, in its various phenomenologies and solid and fluid components, and to the mitigation of associated natural risks. The heart of the INGV are the monitoring rooms where the parameters of earthquakes and tsunamis are calculated in real time. During the visit, the seismic monitoring room located in Rome, with its systems and procedures, will be shown

#### **MID-3- The secrets of the Albano crater lake.**

[\*Anzidei et al.\*](#)

The Albano Lake is the deepest volcanic lake in Italy (about -167 m) and fills the youngest maar of the quiescent Colli Albani volcano. The lake has undergone significant level changes and lahar generating overflows occurred about 5800 yrs B.P. and likely in 398 b.C., when Romans excavated a tunnel drain through the maar wall. Hazardous lake rollovers and CO<sub>2</sub> release are still possible because the Albano volcano shows active ground deformation, gas emission and periodic seismic swarms. In 2005, a high resolution bathymetric survey of the Albano Lake shown 2-D and 3-D images of the crater lake floor, which is made by coalescent and partly overlapping craters and wide flat surfaces separated by some evident scarps. Submerged morphology suggest lake level changes and recent activity of the crater. Presently, the lake level is rapidly falling



Map of the mid-congress field trips.

after the last seismic swarms causing shoreline retreat and the draining of the tunnel.

Stops are planned at the main beach, the roman tunnel and along the lake borders. Local facilities include bar and restaurants, sailing and rowing.

#### MID-4- Archaeoseismological evidence of past earthquakes in Rome.

[Galadini et al.](#)

A number of earthquakes have struck Rome during 5th-9th century A.D. Some earthquakes are known from historical sources (443, 484-508, 618, 801, 847); in some cases (443, 484-508, 801) damage has been documented. Archaeological sources define collapse layers and evidence of destruction at different sites consistent with the effects of seismic shaking. However, chronological constraints are often inconclusive and, therefore, collapse and destruction have been alternatively attributed to one or the other among the mentioned earthquakes. A walk to ancient Rome and through the available traces of past earthquakes of Late Antiquity and the High Middle Ages will try to address problems of seismicity in Rome and central Italy.

#### MID-5- The Colli Albani: a quiescent volcano on the outskirts of Rome.

[Palladino et al.](#)

The Colli Albani volcano, at the gates of Rome, erupted since ~600 ka until at least 36 ka. Given the long dormancies (~38 kyr on average) occurred during its activity history, the volcano has to be considered as quiescent. InSAR data in the last 20 yrs reveal ongoing inflation with maximum uplift rates >2mm/yr in the area hosting the most recent eruptive vents, suggesting that magma recharge is possibly occurring at depth. Despite quite peculiar (high-K<sub>2</sub>O, low-SiO<sub>2</sub>) magma composition, volcanic activity comprised a full range of eruptive styles, from effusive to highly explosive, caldera-forming, pyroclastic flow events. During the excursion, we will cross the Roman Campagna pyroclastic plateau, then we will climb the volcano flanks up to the Tusculum archaeological park, located on the caldera rim, with commanding views over the whole volcanic area. On the way down to the beautiful Albano maar crater lake, we will visit quarry exposures of the Peperino di Marino, the youngest product of Colli Albani. Heading back to Rome, we will look at a calcite-bearing leucite lava flow in a quarry next to the ancient Appian Way. The excursion includes full bus transportation, packed lunch and wine tasting in a local wine estate

#### MID-6- Late Holocene evolution of the Tiber River delta plain.

[Mazzini et al.](#)

The Tiber river delta plain is located 25 km west of Rome, in an area of great interest for the relationships between natural environmental changes and human activity. As ancient Romans, we will navigate the river from downtown Rome to the archaeological site of Portus, Rome's main harbour which owed its own existence to the proximity of the Tiber's mouth and the sea. During pre-Imperial and Imperial Roman times, the landscape and the hydrography of the river were deeply modified. The evolution of the delta coastline is pinpointed by the presence of historical sites, reflecting the progradation of the coast through time.

We will visit some of these historical landmarks, that trace exactly the progradation of the coastline due to disastrous flooding events that affected this area and the city of Rome. One of these events, the flooding of the 28th of December 1870 (+17m), finally led to the construction of the artificial riverbanks on both sides of the river inside the city of Rome. The construction of the dykes, and of 5 dams uphill during the 1960s, has completely changed the relationship between the city and the river, leading to a sensitive decrease of fluvial sediment supply to the coast

**MID-7- Rome before Rome: a river among two volcanoes. Discovering the relationship between the history of the city and the territory.**

[Pantaloni et al.](#)

Water and fire: a river and two volcanoes provided Rome a great chance for its raising and development to evolve into the most important city in the Mediterranean area of the ancient world. The Tiber, with its privileged access to the sea, has been an important communication route for the exchange of goods; the volcanoes have provided raw material for the construction of walls, bridges, aqueducts, roads and buildings. However, water and fire also pose a threat to the city: the floods of the Tiber, the seismicity, the high CO<sub>2</sub> flows linked to the activity of the Alban Hills volcano are elements with which Rome and its inhabitants still have to deal with today.

During the geological walk in the city centre will be possible to observe geological outcrops and, from privileged observation points, the original morphological features and the subsequent urban landscape modifications. The swirling human activity changed the morphology of the Seven Hills and forced the Tiber into the banks, however the wounds from the geological evolution on the city (floods and earthquakes) are still visible. This field trip is a journey through space and time dedicated to the geological and geomorphological evolution of "Rome before Rome".

#### WORKSHOPS AND SHORT COURSES

A range of expert workshops or short courses for students, ECR, or any interested researcher will be available for free or at an additional cost if organizers require. Participants are expected to register to individual workshops or short course through the Exordo platform. We will accept registrants above the maximum number of participants and create a waiting list. The deadline to register will be 20 February 2023.

For specific information about each workshop and short course please refer to the relative convener.

#### WORKSHOPS

- PCW1- **Exploring the interface between Sustainability and Palaeoecology** (Gillson and Ekblom)
- PCW2- **Best practices and data quality challenges for coastal marine proxies in the Arctic ACME Steering Committee** (Heikkilä)
- PCW3- **Reconstructing the Quaternary explosive volcanic history of the Anatolian Peninsula: Implications for volcanic hazard assessments in Turkey** (Puchol)
- MCW1- **International Quaternary Map of Europe IQAME 2500 Consultation Workshop** (Asch and Pantaloni)
- MCW2- **Multi-theme Quaternary database for the Global South: challenges and opportunities** (Benito et al.)
- MCW3- **Integrative paleo-approaches for global conservation challenges** (Gillson and Colombaroli)
- MCW4- **Recent developments in landslide science: Implications for Geomorphic Modeling, Hazard Assessment, and Paleoclimate Proxies** (McCalpin et al.)
- MCW5- **Processes and feedbacks during glacial terminations** (Menviel et al.)

#### SHORT COURSES

- PCSC1- **Introduction to Ostracoda** (Frenzel)
- MCSC1- **An introduction to crestr, an R package to perform probabilistic climate reconstructions from palaeoecological datasets** (Chevalier)
- MCSC2- **Reconstructing past climates from biotic assemblages** (Furlanetto and Liu)
- MCSC3- **Towards consolidating a Latin American Quaternary network** (Soteres et al.)

France - AFEQ

## Journée AFEQ CNF-INQUA / SGF

### Le passé a de l'avenir



This one-day annual meeting was held, in collaboration with the French Geological Society (SGF), in Paris on November 18th under the title "The past has a future". This year, the meeting was dedicated to the celebration of the 60th anniversary of the Association Française pour l'Étude du Quaternaire (AFEQ) founded in 1962. Six senior and six junior researchers presented their recent work with the aim of tracing past research on French Quaternary deposits and to highlight the current and future perspectives of French Quaternary research.

A wide range of topics was selected. They covered almost all areas of the Quaternary, from geomorphological studies (Michel Campy), which formed the basis of the discipline, to the Anthropocene (Michel Magny), including papers on the contribution of geochronology (Mailys Richard), loess (Charlotte Prud'homme) and pollen (Coralie Zorzi) studies to the character and chronology of climatic and vegetation changes during the Quaternary and their possible impacts on biodiversity (Corentin Bochaton) and human evolution (Raymonde Bonnefille). Palaeoceanographic works were also presented to reconstruct climate and evolutionary changes as well as their forcings and mechanisms (Samuel Toucanne, Luc Beaufort), in addition to ice cores studies

focused on changes in past biological productivity (Margaux Brandon), in order to improve our understanding of the parameters contributing to natural changes in atmospheric CO<sub>2</sub> concentration. Finally, two presentations involving model-data comparisons (Pascale Braconnot, Aurélien Quiquet) invited us to reflect on the relevance of climate projections.

This meeting was rich and favourable to interesting debates showing that a large part of the past climate system is far from being understood. Discrepancies still persist between past data and model simulations. Grey areas in our knowledge of the evolution of organisms and biodiversity as well as in the accuracy of palaeoclimate reconstructions, e.g. from geochemical proxies, remains and need to be further investigated. Without this body of knowledge accumulated since the end of the 18th century, we would never have been able to say that present-day global warming is a reality, and that the main cause of atmospheric CO<sub>2</sub> increase is human activities. Quaternary research is a basic science that has not yet said its last word and must therefore be supported unconditionally.



Jule Xiao<sup>1,2</sup> & Thijs van Kolfschoten<sup>3,4</sup>

# Quaternary International: New Releases



## SHIFTING QUATERNARY CLIMATE OVER INDIAN SUB-CONTINENT

Guest Editor  
NELOY KHARE



Cover page of the current issue of Quaternary International  
(Volume 642)

In the second half of the year 2022 a total of 18 Volumes were published in Quaternary International (QI) including 6 Regular Issues and 10 Special Issues (2 Special Issues as double Volumes). For more information, please visit the [Quaternary International](https://www.elsevier.com/locate/qint) website.

### REGULAR ISSUES

The 6 Regular Issues presented a total of 49 articles. Among the 49 articles, 3 are devoted to Coastal & Marine Processes (CMP), 19 to Humans & Biosphere (HABCOM), 12 to Palaeoclimates (PALCOM), 3 to Stratigraphy & Chronology (SACCOM), and 12 to Terrestrial Processes, Deposits & History (TERPRO).

### SPECIAL ISSUES

The 10 Special Issues presented a total of 114 articles with an Editorial for each Issue. Among the 10 Issues, 1 is devoted to CMP, 3 to HABCOM, 2 to PALCOM, 1 to SACCOM, and 3 to TERPRO. These are as follows.

#### [Volumes 626–627](#)

##### **The Archaeology of Human-Bird Interactions: Essays in Honour of Dale Serjeantson Part II**

Edited by Umberto Albarella, Polydora Baker, Evelyne Browaeys, Chiara A. Corbino, Jacqui Mulville, Ged Poland, Fay Worley  
Handled by QI Editor Qingzhen Hao

#### [Volume 629](#)

##### **Understanding the Late Quaternary**

### **Paleomonsoon and Paleoenvironmental Shifts of Asia**

Edited by Hema Achyuthan, Min-Te Chen, Shengfa Liu

Handled by QI Editor Qingzhen Hao

#### Volume 630

### **Quaternary Evolution of the Eastern Baltic Region: From Glaciations and Interglacials to the Recent Global Warming**

Edited by Kristaps Lamsters, Robert Jan Sokolowski

Handled by QI Editor Alexander Francke

#### Volume 632

### **Quaternary Stratigraphy – Sediments, Palaeoenvironments, Fauna and Human Migrations across Central Europe**

Edited by Guzel Danukalova, Markus Fiebig, Pierluigi Pieruccini, Krzysztof Stefaniak, Artur Sobczyk

Handled by QI Editor Qingzhen Hao

#### Volume 633

### **Eurasian Animals and Quaternary Environments: The Contribution of Palaeontology to the SEQS-DATESTRA 2020 Virtual Meeting (Wrocław, Poland) – QI Special Issue Dedicated to Adam Nadachowski**

Edited by Krzysztof Stefaniak, Thijs van Kolfschoten, Urszula Ratajczak-Skrzatek, Artur Sobczyk, Marek Kasprzak

Handled by QI Editor Andrea Zerboni

#### Volume 635

### **Geoarchaeology from Mediterranean Areas to Arid Margins**

Edited by Tara Beuzen-Waller, Adrian G. Parker, Stéphane Desruelles

Handled by QI Editor Pierluigi Pieruccini

#### Volume 636

### **The Late Quaternary Flora, Vegetation and Landscape of the Massif Central (France) under Climatic and Anthropogenic Constrains**

Edited by Jean Nicolas Haas, Hervé Cubizolle, Jacqueline Argant, Jacques-Louis de Beaulieu, André-Marie Dendievel

Handled by QI Editor Alexander Francke

#### Volumes 638–639

### **Lost Landscapes: Reconstructing the Evolution of Coastal Areas since the Late Pleistocene**

Edited by Gaia Mattei, Claudia Caporizzo, Ana Novak, Livio Ronchi, Martin Seeliger

Handled by QI Editor Jan-Berend Stuut

#### Volume 641

### **Quantitative Land-Cover Reconstructions for China over the Past 6000 Years**

Edited by Qinghai Xu, Marie-José Gaillard, Zhuo Zheng, Xiuqi Fang, Jed O. Kaplan

Handled by QI Editor Qingzhen Hao

#### Volume 642

### **Shifting Quaternary Climate over Indian sub-Continent**

Edited by Neloy Khare

Handled by QI Editor Jan-Berend Stuut

#### MOST CITED TOP 10

Below is a list of the top 10 of the most cited articles published in the past 3 years. Among the 10 articles, 3 are devoted to HABCOM, 2 to PALCOM, 2 to SACCOM, and 3 to TERPRO. In addition, 2 are regular articles, and 8 are from Special Issues. These are as follows.

1. Cohen, K.M., Gibbard, P.L., 2019. **Global chronostratigraphical correlation table for the last 2.7 million years, version 2019 QI-500.** *Quat. Int.* **500**, 20–31. [Cited by 82]
2. Bhat, M.S., Alam, A., Ahmad, B., Kotlia, B.S., Farooq, H., Taloor, A.K., Ahmad, S., 2019. **Flood frequency analysis of river Jhelum in Kashmir basin.** *Quat. Int.* **507**, 288–294. [Cited by 59]
3. Gohain, K.J., Mohammad, P., Goswami, A., 2021. **Assessing the impact of land use land cover changes on land surface temperature over Pune city, India.** *Quat. Int.* **575–576**, 259–269. [Cited by 56]
4. Peña-Chocarro, L., Pérez-Jordà, G., Alonso, N., Antolín, F., Teira-Brión, A., Tereso, J.P., Moya, E.M.M., Reyes, D.L., 2019. **Roman and medieval crops in the Iberian Peninsula: A first overview of seeds and fruits from archaeological sites.** *Quat. Int.* **499**, 49–66. [Cited by 52]
5. Head, M.J., 2019. **Formal subdivision of the Quaternary System/Period: Present status and future directions.** *Quat. Int.* **500**, 32–51. [Cited by 46]
6. Akhter, S., Eibek, K.U., Islam, S., Islam, A.R.M.T., Chu, R., Shuanghe, S., 2019. **Predicting spatiotemporal changes of channel morphology in the reach of Teesta River, Bangladesh using GIS and ARIMA modeling.** *Quat. Int.* **513**, 80–94. [Cited by 39]
7. Yao, P., Zhou, B., Lu, Y.H., Yin, Y., Zong, Y.Q., Chen, M.-T., O'Donnell, Z., 2019. **A review of microplastics in sediments: Spatial and temporal occurrences, biological effects, and analytic methods.** *Quat. Int.* **519**, 274–281. [Cited by 38]
8. Lyu, J., Mo, S., Luo, P., Zhou, M., Shen, B., Nover, D., 2019. **A quantitative assessment of hydrological responses to climate change and human activities at spatiotemporal within a typical catchment on the Loess Plateau, China.** *Quat. Int.* **527**, 1–11. [Cited by 38]
9. Ahamad, A., Raju, N.J., Madhav, S., Gossel, W., Wycisk, P., 2019. **Impact of non-engineered Bhalswa landfill on groundwater from Quaternary alluvium in Yamuna flood plain and potential human health risk, New Delhi, India.** *Quat. Int.* **507**, 352–369. [Cited by 38]
10. Wu, L.Z., Deng, H., Huang, R.Q., Zhang, L.M., Guo, X.G., Zhou, Y., 2019. **Evolution of lakes created by landslide dams and the role of dam erosion: A case study of**

**the Jiajun landslide on the Dadu River, China.** [Quat. Int. 503, 41–50](#). [Cited by 38]

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#### MOST DOWNLOADED TOP 10

Below is a list of the top 10 of the most downloaded articles in the last 90 days. Among the 10 articles, 8 are devoted to HABCOM, 1 to PALCOM, and 1 to SACCOM. In addition, 6 are regular articles, and 4 are from Special Issues. These are as follows.

1. de Castro, J.M.B., Martín-Torres, M., 2022. **The origin of the Homo sapiens lineage: When and where?** [Quat. Int. 634, 1–13](#).
2. McClure, S.B., Podrug, E., Jović, J., Monroe, S., Radde, H.D., Triozzi, N., Welker, M.H., Zavodny, E., 2022. **The Zooarchaeology of Neolithic farmers: Herding and hunting on the Dalmatian coast of Croatia.** [Quat. Int. 634, 27–37](#).
3. Benjamin, J., Rovere, A., Fontana, A., Furlani, S., Vacchi, M., Inglis, R.H., Galili, E., Antonioli, F., Sivan, D., Miko, S., Mourtzas, N., Felja, I., Meredith-Williams, M., Goodman-Tchernov, B., Kolaiti, E., Anzidei, M., Gehrels, R., 2017. **Late Quaternary sea-level changes and early human societies in the central and eastern Mediterranean Basin: An interdisciplinary review.** [Quat. Int. 449, 29–57](#).
4. Zalasiewicz, J., Waters, C.N., Williams, M., Barnosky, A.D., Cearreta, A., Crutzen, P., Ellis, E., Ellis, M.A., Fairchild, I.J., Grinevald, J., Haff, P.K., Hajdas, I., Leinfelder, R., McNeill, J., Odada, E.O., Poirier, C., Richter, D., Steffen, W., Summerhayes, C., Syvitski, J.P.M., Vidas, D., Wagreich, M., Wing, S.L., Wolfe, A.P., An, Z., Oreskes, N., 2015. **When did the Anthropocene begin? A mid-twentieth century boundary level is stratigraphically optimal.** [Quat. Int. 383, 196–203](#).
5. White, J.T., Henry, A., Kuehn, S., Loso, M.G., Rasic, J.T., 2022. **Terminal Pleistocene human occupation of the upper Copper River basin, southern Alaska: Results of test excavations at Nataeł Na'.** [Quat. Int. 640, 23–43](#).
6. Wertmann, P., Xu, D., Elkina, I., Vogel, R., Yibulayinmu, M., Tarasov, P.E., La Rocca, D.J., Wagner, M., 2022. **No borders for innovations: A ca. 2700-year-old Assyrian-style leather scale armour in Northwest China.** [Quat. Int. 623, 110–126](#).
7. Larsen, P., 2006. **The agricultural revolution as environmental catastrophe: Implications for health and lifestyle in the Holocene.** [Quat. Int. 150, 12–20](#).
8. Godefroy, L., Salavert, A., Margaritis, E. **Enlightening the darkness: The potential of charcoal analysis for the study of vegetation dynamics and relative exploitation at Krania during the Iron Age Greece.** [Quat. Int., in press](#).
9. Rick, T.C., Alsharekh, A.M., Braje, T.J., Crowther, A., Erlandson, J.M., Fuller, D.Q., Gill, K.M., Groucutt, H.S., Guagnin, M., Helm, R., Hofman, C.A., Horton, M., Kay, A., Korisettar, R., Radimilahy, C., Reeder-Myers, L.,

Shipton, C., Wright, H.T., Petraglia, M., Boivin, N., 2022. **Coring, profiling, and trenching: Archaeological field strategies for investigating the Pleistocene-Holocene-Anthropocene continuum.** [Quat. Int. 628, 1–17](#).

10. Radchenko, S., Kiosak, D., 2022. **The Upper Paleolithic rock art of Ukraine between here and nowhere.** [Quat. Int. 640, 44–60](#).

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#### REMARKS

As the official journal of the International Union for Quaternary Research (INQUA), Quaternary International aims to publish high-quality research articles that present recent advances in all the subdisciplines of Quaternary science. Besides regular submissions, Special issues that are on a certain theme of contemporary Quaternary research and of broad interest for the global Quaternary community are welcomed. We would like to take this opportunity to invite leading scientists to propose special issues to be published in Quaternary International. For further details, please feel free to contact the Editor-in-Chief ([Jule Xiao](#)).

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