

Rise and Shine - A close up portrait of Manly Beacon seen from Zabriskie Point in Death Valley National Park, CA

Αρ. 130 - ΣΕΠΤΕΜΒΡΙΟΣ 2019







ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

# **Τα Νἑα** της Ε Ε Ε Ε Γ Μ

130

ΟΡΓΑΝΩΣΗ ελληνική επιστημονική εταιρεία εδαφομηχανικής & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ ΠΑΝΕΛΛΗΝΙΟ ΣΥΝΕΔΡΙΟ ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ 6-8 ΑΘΗΝΑ NOEMBPIOY ΠΟΛΕΜΙΚΟ ΜΟΥΣΕΙΟ 2019 www.8hcge2019.gr www.hssmge.gr RASMUS PAMMATEIA OPPANOEHE Period Contenentes ours & Travel S.A. Stop Gardin, Kull-top (Strig x 10121 AArps) 210 74: 4763, F.710 7757521

#### ΠΕΡΙΕΧΟΜΕΝΑ

Άρθρα 3				
-	A day in the life of Tunnel Engineer	3		
-	Prof. John Burland	6		
Νέα από τις Ελληνικές και Διεθνείς Γεωτεχνικές Ενώσεις 7				
-	International Society for Soil Mechanics and Geotechnical Engineering	7		
	Conference Review Platform	7		
	Announcing the Publication of the 2019 Geotechnical Business Directory	7		
	Results of E-Meeting Addressing Limits States for Deformation and Settlement	8		
	Additional Information on Joining Videoconference Call	8		
	Proceedings from the 17th European Conference on Soil Mechanics and Geotechnical Engineering available in open access	8		
	Slides for TC210 Workshop on Embankment Dams	8		
	ISSMGE News & Information Circular - September 2019	8		
Пρ	ροσεχείς Γεωτεχνικές Εκδηλώσεις:	10		
-	3rd International Symposium on Coupled Phenomena in Environmental Geotechnics	12		
-	EUROCK 2021 Rock Mechanics and Rock Engineering from theory to practice - ISRM European Rock Mechanics Symposium	12		
-	3 <sup>rd</sup> European Conference on Earthquake Engineering and Seismology	14		
Εv	διαφέροντα - Σεισμοί	15		
-	Ο περίεργος λόγος που οι αρχαίοι Έλληνες έχτιζαν ναούς πάνω σε σεισμικά ρήγματα	15		
	Earthquake faults may have played key role in shaping the culture of ancient Greece	15		
	Seismic faults and sacred sanctuaries in Aegean antiquity	16		
-	Earthquake protection in Kamchatka	17		
Εv	διαφέροντα - Γεωλογία	18		
-	Αδρία: Μια πραγματική χαμένη ήπειρος, θαμμένη κάτω από τη Νότια Ευρώπη και τη Μεσόγειο	18		
	Geologists uncover history of lost continent buried beneath Europe	18		
	Orogenic architecture of the Mediterranean region and kinematic reconstruction of its tectonic evolution	10		
_	Pohiti Kamani: The Stone Forest in Bulgaria	20		
_	Geological wonders	21		
	The lakes of Band-e Amir National Park, Afghanistan	21		
	Angel Falls and Mount Roraima, Venezuela	21		
	Ennedi Plateau, Chad	21		
Εv	διαφέροντα - Περιβάλλον	27		
-	Ο άνθρωπος αλλάζει το πρόσωπο της Γης εδώ και χιλιάδες χρόνια	27		
	Archaeological assessment reveals Earth's early transformation through land use	27		
Εv	διαφέροντα - Λοιπά	29		
-	Epic engineering rescued colossal ancient Egyptian			
	temples from floodwaters	29		
-	Prestressed Concrete Slab Step by Step	33		
-	the pance of the mississippi over the last three thousand years	33		



Mount Pavlof and Pavlof Sister Volcano, Nelson Lagoon, Alaska, United States

#### Αναμνήσεις διακοπών

*Γίνετε Αρθρογράφοι του περιοδικού*. Περιγράψτε έναν ενδιαφέροντα τόπο των διακοπών σας με τεχνικό, γεωτεχνικό και γεωλογικό ενδιαφέρον, πλαισιώνοντας την περιγραφή σας με φωτογραφίες.

### ΑΡΘΡΑ

#### A day in the life of Tunnel Engineer

#### **Arpan Garg**

Working underground is never easy, no matter what people may say. Have you ever feared while going inside the tunnel? Does it ever cross your mind that what will happen if it collapses, will I be able to survive and see the light of the day? Well, let me tell you, all these thoughts crosses in the mind of tunnel engineers/workers who are working in tunnel construction. Today, I am going to share my experience on tunnel construction in weathered rock. The construction process in weathered rock is not as easy as it seems from its name, rather it is one of the toughest while continuing through a weathered rock. As it is widely known, that a tunnel is an artificial/manmade underground passage, especially one built through a hill or under a building, road or river. Tunnels are not only structures constructed of concrete, steel, masonry and timber or bored into a rock but also for other numerous functional systems to perform various roles. Although, there are abundant methods defined for carrying out the underground construction but whenever a difficult situation arises like formation of cavities, flowing ground conditions, extremely fractured & weathered rock conditions, rock bursting etc. then only it is realized that to cater such anomalies the team requires courage, patience, experience and presence of mind in this time of crises to progress and achieve the progress with utmost safety.

#### Construction of Tunnel (Adit) in poor rock strata

The construction was started in March'2010 with conventional drilling and blast methodology. The rock encountered while constructing the portal of the Adit (having dia. 7.5 m, D-shaped) was Amphibolite which is a hard and competent rock. So it was a relief for the team that the expected rock will be the same throughout the tunnel, but there goes a saying "What's the thrill of going easy in life" and soon the day arrived when the rock changed its behaviour and the whole optimism of the team was shattered. We hardly progressed around 25 m from the portal and there was loose fall from the face to which it was decided that more permanent supports like steel ribs (ISHB-  $150 \times 50$ ) needs to be installed.

#### The Battle begins....



**Ribs and Fore-poling:** – Ribs were installed and to pack the face, fore-poles having 25 mm dia. were installed, but due to the presence of 1 to 1.5 m thick phyllite rock band in the crown portion, the crown portion was mutilated and the small

rock fragments fell down which was very disheartening after all the hard work put by the people in packing the face, but no hope was lost by the team, the rectification was completed and the portion behind the rib was backfilled by concrete.



**Progressing at snail pace:** – Poor rock strata continued, as a result the progress started coming at snail pace. As we progressed inside, the deterioration of rock continued, and now various excavation methods were employed. Installation of ribs, lagging and backfill took more time resulting in more unsafe working condition due to less stand-up time of rock, so it was change to lattice grider, wiremesh and thick layer of sealing shotcrete. This pattern gave some additional safety benefits as well as strength benefits as the lower grade back-fill was replaced by higher grade shotcrete and the amount of time during which workers remain in direct contact with the rock was also reduced.



**Cavity formation and treatment:** – By this time, we got much versed with the geology of the rock and the various methods that can be employed to overcome if such situation arises. Again, the history repeated itself and we came back from where we started. Ribs, lagging, backfill came into the picture again but this time we did a slight improvisation by using another support system. This time Pipe roofing (Umbrella formation) was introduced to cover the cavity and to proceed further upto certain depth of the tunnel with comfort.







**Excavation using twin cutter:** – While the rock was very loose and falls under the category of sheared Micaceous Phyllite, it was the time when we first introduced a new digging machine called as Twin cutter which was also the first type of equipment to be used at our site in the project. It was a kind of machine which scratches the tunnel face due to lose nature

of the rock and there was no need to take any blast or even no breaker was required which will disturb the surrounding area due to its vibrations. Twin cutter is basically an attachment that can be surmounted on an excavator with a cuter head having blades as can be seen in the picture below:







**Elephants foot:** – Although, twin cutter was deployed but still it was feared that due to excessive stress in the rocks and with very less stand-up time of the rock, it can collapse any time an there can be a chaos while proceeding inside. So, to overcome this possibility, only side cutting of the face was done i.e. space creation only for ribs/lattice girder erection and leaving the centre portion of the tunnel face as it is

as shown in the fig. below. This kind of excavation was called as Elephant's foot where the tunnel face is supported at the centre using its own weight. This method can be related to the Hindu epic Ramayana to as Angad's foot where many potential people tried but none was successful in lifting his foot. This helped us in preventing the collapse of tunnel face by using its own weight as its support.

![](_page_4_Picture_1.jpeg)

![](_page_4_Picture_2.jpeg)

![](_page_4_Picture_3.jpeg)

Similarly, while moving forward, the centre portion was removed gradually to make space for the equipment and the same process was carried on excavating the tunnel.

To conclude, I will only say that there can be plenty of methods which can be devised for safe tunnelling. It solemnly depends upon the in-depth knowledge, experience and the presence of mind which is needed while encountering these situations.

I hope you will find this helpful and can plan the excavation methodology accordingly.

Happy Tunnelling.

https://taiym.home.blog/2019/09/09/a-day-in-the-life-oftunnel-engineer/

#### **Prof. John Burland**

![](_page_5_Picture_1.jpeg)

#### Civil engineering: An oral history Part 1 - Engineering heroes

ICE interviewed Professor John Burland as part of its oral history of civil engineering programme. In part one, John discusses his civil engineering heroes, Karl von Terzaghi and Alec Skempton.

https://www.youtube.com/watch?v=C8K8cDZzbPc

#### Part 2 - Propping up Pisa

Professor John Burland, 'the man who propped up Pisa' talks about his 12 year involvement with the Leaning Tower of Pisa.

https://www.youtube.com/watch?v=04MbizZtHak

#### Part 3 - Parking under Parliament

Professor John Burland talks through the process of creating a car park underneath the Mother of Parliaments in Westminster, and the impact this had on how geotechnical projects are managed.

https://www.youtube.com/watch?v=6eknBQucHT4&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=9&t=0s

#### Part 4 - A career in civil engineering

Professor Burland explains why a career in civil engineering is so rewarding.

https://www.youtube.com/watch?v=q7TDXKAZpP8&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=10&t=0s

#### Prof. John Burland on Soils

#### 1. What is soil mechanics?

https://www.youtube.com/watch?v=ZuofAC9rq58&list=PLm\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6 &index=2&t=0s

#### 2. The Particulate Nature of Soil

https://www.youtube.com/watch?v=mB3O6hQAoZA&list=P Lm XdL5VWE uADbL7Mf2hJVIKkCZWuwP6&index=3&t=0s

#### 3. The Effect of Gravity on Soil Strength

https://www.youtube.com/watch?v=-EUQcluC-ZQ&list=PLm XdL5VWE uADbL7Mf2hJVIKkCZWuwP6&index=4&t=0s

4. The Effect of Particle Size and Strength on Soil Strength

https://www.youtube.com/watch?v=qY\_PRCmg85E&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=5&t=0s

#### 5. The Effect of Water on Soil Strength

https://www.youtube.com/watch?v=a-6YbkZJ5UY&list=PLm\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP 6&index=6&t=0s

#### 6. The Soils of London

Professor Burland of Imperial College - the man who saved the Leaning Tower of Pisa - explains the structural geology of London and the condition of soil types more broadly.

https://www.youtube.com/watch?v=t4vZ9ojOOw0&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=11&t=0s

#### 7. Professor John Burland Is Concerned About The Leaning Tower of Pisa Falling By Earthquake!

Professor John Burland who oversaw the 1990 to 2001 rehabilitation of the Tower said it is faced with a MAJOR RISK - a very strong Earthquake!

https://www.youtube.com/watch?v=mvOPg5PBP0E&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=12&t=0s

#### 8. The Enigma of the Leaning Tower of Pisa - 1998 Buchanan Lecture by John B. Burland

https://www.youtube.com/watch?v=hGVYZ6uaGGU&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=13&t=0s

#### 9. On the Inside The Leaning Tower of Pisa

https://www.youtube.com/watch?v=3gTq4WggLp0&list=PL m\_XdL5VWE\_uADbL7Mf2hJVIKkCZWuwP6&index=14&t=0s

### ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

![](_page_6_Picture_1.jpeg)

#### International Society for Soil Mechanics and Geotechnical Engineering

#### **Conference Review Platform**

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) is pleased to announce the launch of its Conference Review Platform (CRP). The ISSMGE Conference Review Platform is now part of ISSMGE's cyber-infrastructure and aims to support the review of abstracts and papers for Conferences organized by ISSMGE Member Societies, Technical Committees and other groups affiliated with ISSMGE.

The CRP is an initiative of the Innovation and Development Committee (IDC) of the ISSMGE, and is part of a broader effort to support open access availability of the scientific papers published in these conferences. This CRP forms an integral part of the on-going development of the ISSMGE "virtual" university, which was initiated by the President at his inaugural address on 21st September 2017 in Seoul. The platform has the capability to review abstracts and papers submitted by authors. Information on the functionality of the platform is provided <u>here</u>. The platform is expected to facilitate the review process of conference papers, alleviate the administrative burden of organizing such conferences, reduce costs, and improve quality by promoting systematic review procedures of conference papers.

The platform can be used by conference organizers of the ICSMGE, ISSMGE sponsored events, ISSMGE regional conferences, or conferences organized or sponsored by Technical Committees. Member Societies can also directly request to use the platform. When the conditions above are not satisfied, or if other parties wish to use the platform, a special request should be directed to the President, Secretary General, or the Chair of the Innovation and Development Committee (IDC).

This platform is provided at no cost with the requirement that published papers will become available in open access through the <u>ISSMGE Online Library</u>, which is another integral part of the ISSMGE "virtual" university. The platform also ensures a seamless integration with the ISSMGE Online Library.

The output of the conference paper review system is the accepted papers (in pdf and word file) of the conference that can then be exported from the system and either be published by the organizer as a printed volume, and/or forwarded for inclusion as a database in the Open-Access Online Library of ISSMGE. IDC is also exploring the possibility of ISSMGE supporting publication of proceedings (at some cost) as well as indexing of conference proceedings in indexes such as Scopus.

The platform, which is available <u>here</u>, is already used by the  $6^{\rm th}$  International Site Characterization conference, and can support the review of papers for multiple conferences at the same time.

ISSMGE is very excited to make this cyber-infrastructure available to the geo-community. We hope it will further support unrestricted access to scientific material at a global scale. If you have any feedback, please feel free to contact ISSMGE.

On behalf of the ISSMGE,

Charles W.W. Ng, President of the ISSMGE

Dimitrios Zekkos, Chair of ISSMGE Innovation and Development Committee

### Announcing the Publication of the 2019 Geotechnical Business Directory

![](_page_6_Picture_16.jpeg)

Geoworld, the network for geotechnical engineers, has just published the 2019 Geotechnical Business Directory. The directory is published with the support of the International Society for Soil Mechanics and Geotechnical Engineering. This is the fifth year for the Geotechnical Business Directory, the most comprehensive directory in the geotechnical engineering field!

This truly unique directory is available in **three** formats:

- (a) an **Online Interactive Platform**,
- (b) an e-book, and
- (c) in-print through Amazon

The 2019 index has grown significantly since last year and includes **9000+ members**, and **700+ geo-companies** and **geo-organizations** from a total of **153 countries**. It is expected to reach 50,000+ professionals through various media channels. The online platform of the directory allows visitors to search for professionals or companies based on location, experience, expertise, industry and other parameters. **There is no other such directory in geotechnical engineering**. The directory is also a "live" publication in the sense that as more members join and complete their profiles, the publication will become more comprehensive.

![](_page_6_Picture_24.jpeg)

The online platform of the directory, which is updated daily, has increased search functionality compares to the e-book and printed version.

Geoworld's team is already working on the 2020 Business Directory that is expected to include 16,000+ individuals and 800+ companies and organizations.

Income generated from the Geotechnical Business Directory is also directed as a donation to the ISSMGE Foundation.

If you are not a member of <u>GeoWorld</u>, visit the website and join at no cost, so that you can be part of the 2020 Geotechnical Business Directory.

#### Results of E-Meeting Addressing Limits States for Deformation and Settlement

Results are now available regarding the e-exchange held among TC218 members to address limits states considerations for reinforced soil structures for deformation and settlement. This information was released on September 23, 2019. Please contact TC218 Committee Secretary Giulia Lugli (<u>g.lugli@maccaferri.com</u>) for a pdf copy of the e-exchange.

#### Additional Information on Joining Videoconference Call

The TC218 committee holds regular quarterly Videoconference calls on a rotating basis to accommodate the local times of 3 global regions in the Americas, Euro/Africa and Asia/Australia. To join, please contact the Committee Secretary, Giulia Lugli (g.lugli@maccaferri.com). Please provide Giulia your name and preferred contact e-mail address. The next videoconference call will be held on October 17th.

#### Proceedings from the 17th European Conference on Soil Mechanics and Geotechnical Engineering available in open access

The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of the Chair of the Icelandic Geotechnical Society Mr. Haraldur Sigursteinsson, the 675 papers from the proceedings of 17th European Conference on Soil Mechanics and Geotechnical Engineering held in Reykjavík, Iceland, 1 – 6 September 2019 are available in the online library here:

#### https://www.issmge.org/publications/online-library

Detailed acknowledgements for the 17th European Conference on Soil Mechanics and Geotechnical Engineering can be found at the <u>ISSMGE online library acknowledgements sec-</u><u>tion</u>.

#### Slides for TC210 Workshop on Embankment Dams

Slides for TC210 Workshop on Embankment Dams

https://www.issmge.org/filemanager/article/678/Zhang LM 2019-9-1 TC210 Sunday Workshop.pdf https://www.issmge.org/filemanager/article/678/Giuseppe Lanzo 2019 09 01 Rekiavik rev2.pdf

https://www.issmge.org/filemanager/article/678/Oliver Detert TC210 2.pdf

https://www.issmge.org/filemanager/article/678/Stefania Sica TC210 16noni.pdf

#### ISSMGE News & Information Circular -September 2019

#### 1. TC306 Geo-Engineering Education Survey - A message from the Officers of TC306

Dear ISSMGE member,

If you are an instructor in a civil engineering department, please contribute to a TC306 Geo-Engineering Education survey. The title of the survey is "What Geotechnical Engineering Educational Material can we dream of?"

If you have very limited time but don't want to miss the opportunity to contribute, just jump to Question 11 (the only required): Please imagine and describe the "educational material of your dreams".

You will find the questionnaire here: <u>https://www.survey-monkey.com/r/TC306</u>

Best regards,

Marina Pantazidou and Michele Calvello (Chair and Secretary of TC306)

#### 2. Are We Overdesigning? – A Survey of International Practice

A joint initiative by the CAPG, the YMPG, TC205 - Safety and Serviceability, and TC304 - Risk.This survey is intended to assess the consistency of calculation models and design methods for a variety of geotechnical structures and, where possible, to compare the results with full-scale tests and reliability analyses.To participate in the survey please click . The closing date for inclusion of the responses in the report to the Asian Regional Conference is 09 September 2019.

#### 3. New TCs

These new TCs are actively seeking nominations for members from the Member Societies.Please make sure that your Member Society representative is aware of your interest in joining either of these Committees.

### System Performance of Geotechnical Structures (TC219 – System Performance)

The System Performance of the geotechnical structures calls for the geotechnical system to have enough robustness and redundancy to prevent from collapses or failures induced by the localized damage or weakness. The TC aims to disseminate and develop knowledge and practice on system performance design methodologies and theories in geotechnical engineering <u>https://www.issmge.org/committees/technicalcommittees/applications/system-performance</u>)

#### Field Monitoring in Geotechnics (TC220 – Field Monitoring)

FieldMonitoringinGeomechanicshttps://www.issmge.org/committees/technical-commit-<br/>tees/applications/field-monitoring)deals with assessing the

performance of engineering structures using instrumentation and other related information. The applications include dams and embankments, structures and foundations, transport infrastructure including tunnels and other underground openings, open cut and underground mines, natural slopes, land reclamation, repositories for industrial or nuclear waste and offshore structures.

#### 4. IS-Cambridge 2020 - Preliminary Selection of Potential Bright Spark Lecturers

To promote young members of ISSMGE to play a major role in various international and regional conferences, the President of ISSMGE, Professor Charles Ng, created the Bright Spark Lecture Award for promising young geotechnical professionals/academics to have a chance to deliver a keynote lecture at a major ISSMGE sponsored conference.

#### Selection and approval procedure:

The local IS-Cambridge 2020 organising committee is responsible for the preliminary selection of potential Bright Spark lecturers, in collaboration with the Young Member Presidential Group (YMPG). The CVs of the preliminarily selected candidates (a maximum of shortlist of four) will be submitted to the President of ISSMGE for a final decision on the awardee.

Further information: <u>https://www.is-cam-</u> <u>bridge2020.eng.cam.ac.uk/programme/brightspark</u>

#### 5. News from Japanese Geotechnical Society

### Invitation to submit to Soils and Foundations, Open Access Journal

Soils and Foundations (S&F) is your core geotechnical journal; it has been the official journal of the Japanese Geotechnical Society (JGS) since 1960. The journal publishes a variety of original research papers, technical reports, technical notes, geo-disaster reports as well as state-of-the-art reports in the fields of soil and rock mechanics, geotechnical engineering, and environmental geotechnics. The 2018 Impact Factor for S&F was 1.673, and the 5-Year Impact Factor was 2.567 according to Clarivate Analytics Journal Citation Reports 2019.

S&F has been available online since the February 2012 issue in partnership with Elsevier. We are delighted to announce the flip of S&F to online-only, author-pays, gold open access journal offering authors a rapid way to publish peer-reviewed science from January 2020. All gold open access articles are free for everyone to read because the article publishing charge (APC) that authors, their institutions or funding bodies pay, covers all expenses needed to support the publication process. The APC fee of S&F is US\$1,000 excluding tax and specific guidelines can be found on its Journal homepage. Gold open access may lead to an increase in the impact of an author's research.

https://www.sciencedirect.com/journal/soils-and-foundations/

#### 6. ISSMGE Webinars and Virtual University

Click <u>here</u> for a full list of previously recorded ISSMGE webinars. Past webinars with a common theme have been grouped together to create courses within the ISSMGE Virtual University and information about these can be found <u>here</u>.

Please note that a couple of **webinars in French** have been added to the list on the website.

#### 7. Bulletin

The latest edition of the ISSMGE Bulletin (Volume 13, Issue

4, Aug 2019) is available from the website from https://www.issmge.org/publications/issmge-bulletin/vol-13-issue-4-august-2019

#### 8. ISSMGE Foundation

The next deadline for receipt of applications for awards from the ISSMGE Foundation is the **1**<sup>st</sup> **November 2019**. Click <u>here</u> for further information on the <u>ISSMGE Foundation</u>.

### ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

Για τις παλαιότερες καταχωρήσεις περισσότερες πληροφορίες μπορούν να αναζητηθούν στα προηγούμενα τεύχη του «περιοδικού» και στις παρατιθέμενες ιστοσελίδες.

Energy Geotechnics: Mechanics of the energy transition, October 3<sup>rd</sup>, 2019, Delft, Netherlands, <u>www.aanmelder.nl/ener-gygeotechnics</u>

2019 AYGE 7<sup>th</sup> African Young Geotechnical Engineers Conference, 6 October 2019, Cape Town, South Africa, <u>www.arc2019.org/ayge-landing</u>

XVII African Regional Conference on Soil Mechanics and Geotechnical Engineering 07-10 October 2019, Cape Town, South Africa, <u>www.arc2019.org</u>

HYDRO 2019 Concept to closure: practical steps, 14-16 October 2019, Porto, Portugal, <u>www.hydropower-</u> <u>dams.com/hydro-2019</u>

XVI Asian Regional Conference on Soil Mechanics and Geotechnical Engineering, 14 - 18 October 2019, Taipei, China, www.16arc.org

Developing Resilient Cities of the Future through the Integration of Tunneling and Underground Space Use, 15-17 October 2019, Nigeria, <u>events@tunnellingnigeria.org</u>

11ème Édition des Journées Africaines de la Géotechnique, 21-24 Octobre 2019, Niamey, Niger, http://ctgaafrique.org/niamey-niger-ville-hote-de-11emeedition-journees-africaines-de-geotechnique

4th Regional Symposium on Landslides in the Adriatic-Balkan Region – ReSyLAB 2019 - 9th Scientific and Expert Conference GEO-EXPO 2019 23rd to 25th of October 2019, Sarajevo, Bosnia and Herzegovina, <u>www.geotehnika.ba/Re-</u> <u>SyLAB & GEO-EXPO 2019.html</u>

8° Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής, 6 – 8 Νοεμβρίου 2019, Αθήνα, Ελλάς, <u>www.8hcge2019.gr</u>

2019 GEOMEAST International Congress & Exhibition, 10 -14 November 2019, Cairo, Egypt, <u>www.geomeast2019.org</u>

The 8<sup>th</sup> International Symposium on Roller Compacted Concrete (RCC) Dams, Nov. 11<sup>th</sup> – 12<sup>th</sup>, 2019, Kunming, China, <u>chincold-en@vip.126.com</u>, <u>http://www.chincold.org.cn</u>

8th International Geotechnical Symposium, 13-15 November 2019, Istanbul, Turkey, <u>www.geoteknik2019.org/en/</u>

XVI Panamerican Conference on Soil Mechanics and Geotechnical Engineering, 18-22 November 2019, Cancun, Quintana Roo, Mexico, <u>http://panamerican2019mex-</u> ico.com/panamerican

International Symposium on Rock Mechanics and Engineering for Sustainable Energy, 22-24 November 2019, Hanoi, Vietnam, <u>http://vietrocknet.org</u> GEOTEC HANOI 2019 The 4<sup>th</sup> International Conference on Geotechnics for Sustainable Infrastructure Development, November 28 – 29, 2019, Hanoi, Vietnam, <u>https://geotechn.vn</u>

3rd International conference on Geo-Energy & Geo-Environment Conference, Nov. 30 – Dec. 1 2019, ChangSha, China, <u>www.gege2019.com</u>.

YSRM2019 - The 5th ISRM Young Scholars' Symposium on Rock Mechanics and REIF2019 - International Symposium on Rock Engineering for Innovative Future - Future Initiative for Rock Mechanics and Rock Engineering - Collaboration between Young and Skilled Researchers/Engineers - 1-4 December 2019, Okinawa, Japan, <u>www.ec-</u> pro.co.jp/ysrm2019/index.html

ICGU 4<sup>th</sup> 2019 4<sup>th</sup> International Conference on Ground Improvement and Ground Control (ICGI2019): Infrastructure Development and Natural Hazards Mitigation, 1-3 December 2019, Luxor, Egypt, <u>https://icgi2019-ets.org/page/p/Welcome-ICGI</u>

ETS Conference and Exhibition 2019, 4-5 December 2019, Luxor – Egypt, <u>https://icgi2019-ets.org/page/p/Welcome-ETS</u>

ISOG 2019 First Indian Symposium on Offshore Geotechnics, December 5-6, 2019, IIT Bhubaneswar, Odisha, India, https://sites.google.com/iitbbs.ac.in/isog2019/home

15th International Conference on Geotechnical Engineering, and 9th Asian Young Geotechnical Engineers Conference, 05 ÷ 07-12-2019, Lahore, Pakistan, <u>http://www.pges-pak.org</u>

GeoSS International Conference on Case Histories & Soil Properties, 5-6 December 2019, Singapore, www.iccs2019.org

1st ITA-CET Meeting for European Tunnelling Professors and PhD Students, 5-6 December 2019, Torino, Italy, <u>ita-cet.sec-retariat@developpement-durable.gouv.fr</u>

ISSPDS-Edinburgh 2020 2nd International Symposium on Seismic Performance and Design of Slopes, January 18–22, 2020, Edinburgh, UK, <u>www.isspds.eng.ed.ac.uk</u>

International Conference on Geotechnical Engineering – Iraq, 19 - 20 February 2020, Baghdad, Iraq, <u>http://issmfe.org/in-</u> ternational-iraqi-geotechnical-conference

ASIA 2020 Eighth International Conference and Exhibition on Water Resources and Renewable Energy Development in Asia, 10 - 12 March 2020, Kuala Lumpur, Malaysia, <u>www.hy-dropower-dams.com/asia-2020</u>

GeoAmericas 2020 4<sup>th</sup> Pan American Conference on Geosynthetics, 26-29 April 2020, Rio de Janeiro, Brazil, <u>www.geoamericas2020.com</u>

WTC 2020 ITA-AITES World Tunnel Conference, 15-21 May 2020, Kuala Lumpur, Malaysia, <u>www.wtc2020.my</u>

14th Baltic Sea Geotechnical Conference 2020 Future Challenges for Geotechnical Engineering, 25 ÷ 27 May 2020, Helsinki, Finland, <u>www.ril.fi/en/events/bsgc-2020.html</u>

Nordic Geotechnical Meeting Urban Geotechnics, 25-27 May 2020, Helsinki, Finland, <u>www.ril.fi/en/events/ngm-2020.html</u>

ICED 2020 First International Conference on Embankment Dams: Dam Breach Modeling and Risk Disposal, 5 – 7 June 2020 in Beijing, China, <u>http://iced-2020.host30.voosite.com</u>

EUROCK 2020 Hard Rock Excavation and Support, 13-19 June 2020, Trondheim, Norway, <u>www.eurock2020.com</u>

DFI Deep Mixing 2020, 15 to 17 June 2020, TBD, Gdansk, Poland, <u>www.dfi.org/DM2020</u>

XIII International Symposium on Landslides - Landslides and Sustainable Development, June 15<sup>th</sup> – 19<sup>th</sup> 2020, Cartagena, Colombia, <u>www.scg.org.co/xiii-isl</u>

GEE2020 International Conference on Geotechnical Engineering Education 2020, June 24-25, 2020, Athens, Greece, <u>www.erasmus.gr/microsites/1168</u>

E-UNSAT 2020 4th European Conference on Unsaturated Soils - Unsaturated Horizons, 24-06-2020 ÷ 26-06-2020, Lisbon, Portugal, <u>https://eunsat2020.tecnico.ulisboa.pt</u>

#### **03 80**

#### Geotechnical Aspects of Underground Construction in Soft Ground 29 June to 01 July 2020, Cambridge, United Kingdom

Organiser: University of Cambridge Contact person: Dr Mohammed Elshafie Address: Laing O'Rourke Centre, Department of Engineering, Cambridge University Phone: +44(0) 1223 332780 Email: <u>me254@cam.ac.uk</u>

**(3 8)** 

![](_page_10_Picture_8.jpeg)

#### 16th International Conference of the International Association for Computer Methods and Advances in Geomechanics – IACMAG 29-06-2020 ÷ 03-07-2020, Torino, Italy

The 16th International Conference of the International Association for Computer Methods and Advances in Geomechanics (15IACMAG) will be held in Turin, Italy, 29 June - 4 July 2020. The aim of the conference is to give an up-to-date picture of the broad research field of computational geomechanics. Contributions from experts around the world will cover a wide range of research topics in geomechanics.

Pre-conference courses will also be held in Milan and Grenoble.

Contact Information Contact person: Symposium srl Address: via Gozzano 14 Phone: +390119211467 Email: <u>info@symposium.it</u>, <u>marco.barla@polito.it</u> 7th ICRAGEE International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, 13 – 16 July 2020, Bengaluru, India, <u>http://7icragee.org</u>

3<sup>rd</sup> International Conference on Geotechnical Engineering (ICGE – Colombo -2020), 10 - 11 August 2020, Colombo, Sri Lanka, <u>http://icgecolombo.org/2020/index.php</u>

ISFOH 2020 4th International Symposium on Frontiers in Offshore Geotechnics, 16 – 19 August 2020, Austin, United States, <u>www.isfog2020.org</u>

2020 CHICAGO International Conference on Transportation Geotechnics, August 30 - September 2, 2020, Chicago, Illinois, USA, <u>http://conferences.illinois.edu/ICTG2020</u>

EUROGEO WARSAW 2020 7<sup>th</sup> European Geosynthetics Congress, 6-9 September 2020, Warsaw, Poland, <u>www.euro-</u><u>geo7.orq</u>

**CS 80** 

![](_page_10_Picture_19.jpeg)

37<sup>th</sup> General Assembly of the European Seismological Commission 6 to 11 September 2020, Corfu, Greece <u>www.esc-web.org</u>

**(37 SO)** 

6th International Conference on Geotechnical and Geophysical Site Characterization "Toward synergy at site characterisation",  $7 \div 11$  September, Budapest, Hungary, <u>www.isc6-budapest.com</u>

ICEGT-2020 2nd International Conference on Energy Geotechnics, September 20-23, 2020, La Jolla, California, USA, https://iceqt-2020.eng.ucsd.edu/home

Fourth International DAM WORLD Conference, 21-25th September 2020, Lisbon, Portugal, <u>https://dw2020.lnec.pt</u>

**03 80** 

ARMS11 11th Asian Rock Mechanics Symposium, Challenges and Opportunities in Rock Mechanics 23-27 October 2020, Beijing, China

**(3 8)** 

![](_page_11_Picture_1.jpeg)

#### 3rd International Symposium on Coupled Phenomena in Environmental Geotechnics October 29th – 30th, 2020, Kyoto, Japan <u>https://cpeq2020.org</u>

We are delighted to open the call for abstracts for CPEG2020, the "Third International Symposium on Coupled Phenomena in Environmental Geotechnics", which will be held at Kyoto University's main campus on October 29th and 30th, 2020.

CPEG is a quadrennial event organized under the auspices of the Technical Committee TC215 (Environmental Geotechnics) of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), with a focus on coupled processes (e.g., chemical-physical, bio-physical, multiphase flow, etc.) in environmental geotechnics.

The first symposium of the series was held in Torino (Italy) in 2013, and the second one in Leeds (UK) in 2017.

The third symposium, CPEG2020, will be conjointly organized by the Japanese Geotechnical Society (JGS) and Kyoto University, and welcomes submissions from all over the world.

As in our previous symposiums, we look forward to your contributions to CPEG2020 and to meet with you in Kyoto, the Ancient Capital of Japan, next year, for what we expect to be a vibrant scientific event!

#### Symposium Themes

CPEG2020 will be organized under the following themes. When submitting an abstract, please choose the one that best fits your topic. Use the examples as references.

Note that the organizers may reclassify your submission to a different theme depending on other submissions.

#### **Coupled Processes**

E.g., improved understanding of coupling of any natural and/or anthropogenic thermo-hydro-mechanical-chemicalbio-gas processes within soils and rocks, biogeochemical processes for improving or stabilizing soils, multi-phase flow, etc.

#### **Soil-Atmosphere Interaction**

E.g., role of vegetation in sustainable management of slopes and geostructures, vegetation controls on urban flooding, geotechnics of the soil critical zone: creation or restoration of full soil functionality, etc.

#### Surface Containment

E.g., landfill liners and environmental barriers, gas generation and extraction, capping systems for landfills and polluted sites, etc.

#### **Clean-up and Remediation**

E.g., novel characterization of contaminated sites, pollutant retardation and degradation processes, active barriers for polluted sites, bio-remediation of metals and radionuclides, natural attenuation and enhanced bioremediation of organic pollutants, etc.

#### **Waste Geotechnics**

E.g., waste characterization, radioactive waste disposal, carbon capture and storage, waste degradation and settlement, mining and mineral extraction wastes, etc.

#### **Energy Geotechnics**

E.g. energy geo-storage and geo-structures, numerical methods in energy geotechnics, geoenvironmental aspects of energy geotechnics, geosynthetics in energy applications, geotechnical challenges for energy infrastructure, etc.

#### **Bio-inspired/mediated Geotechnics**

E.g., hazard mitigation, environmental protection and restoration, ground improvement, etc.

#### Reclamation

E.g., environmental aspects of land reclamation, soil improvement, ground stabilization and its effects on contamination, coastal landfills, etc.

#### Others

Any topic not listed previously

**CS 80** 

5<sup>TH</sup> World Landslide Forum Implementation and Monitoring the USDR-ICL Sendai Partnerships 2015-2015, 2-6 November 2020, Kyoto, Japan, <u>http://wlf5.iplhq.orq</u>

10<sup>th</sup> International Conference on Scour and Erosion (ICSE-10), November 15-18, 2020, Arlington, Virginia, USA, www.engr.psu.edu/xiao/ICSE-10 Call for abstract.pdf

#### **CS 80**

### GeoAsia 2021

7th Asian Regional Conference on Geosynthetics March 1-4, 2021, Taipei, Taiwan

#### **CS 80**

![](_page_11_Picture_36.jpeg)

EUROCK 2021 Rock Mechanics and Rock Engineering from theory to practice

#### ISRM European Rock Mechanics Symposium 21-25 June 2021, Torino, Italy <u>http://eurock2021.com</u>

It is a great pleasure and an honour to extend to you a warm invitation to attend the EUROCK 2021 *Rock Mechanics and Rock Engineering from theory to practice* in Turin, Italy, 21 to 25 June 2021.

As in the previous editions, the conference topics will address trough general and parallel sessions the most recent developments in rock mechanics, stimulations fruitful technical and scientific interaction within the fields of rock mechanics, rock engineering and engineering geology.

The programme includes workshops dedicated to innovative topics, Keynotes lectures delivered by distinguished speakers and a series of technical visit that coupled scientific topics with cultural, touristic and eno – gastronomical aspects.

Most of parallel sessions will be opened with a Theme Lecture and will continue with 9 to 11 presentations. Other papers will be presented in three poster sessions each one lasting a whole day.

Technical visits are scheduled as the closure of Wednesday programme, while the gala dinner will be hosted on Tuesday night.

Technical visits are scheduled in the days after the conference.

#### Topics

- Rock properties and testing methods
- Rock mass characterization
- Rock mechanics for heritage
- Rock mechanics for infrastructures
- Geophysics in rock mechanics
- Numerical modeling and back analysis
- Nonlinear problems in rock mechanics
- Mining rock mechanics
- Design methods and analysis
- Monitoring and back analysis
- Excavation and support
- Risk and hazard
- Petroleum engineering and hydrofracking
- Applicability of EUROCODE-7 in rock engineering

#### Associazione Geotecnica Italiana

Tel. +39 06 4465569 - +39 06 44704349 Fax +39 06 44361035 Email <u>info@eurock2021.com</u> Email <u>agi@associazionegeotenica.it</u> Address Viale dell'Università 11, 00185 Roma

#### **(3 W)**

5th International Workshop on Rock Mechanics and Engineering Geology in Volcanic Fields 9-11 September 2021, Fukuoka, Japan <u>isrm-office@rocknet-japan.org</u>

**(38 )** 

SYDNEY ICSMGE 2021 20<sup>th</sup> International Conference on Soil Mechanics and Geotechnical Engineering, 12-17 September 2021, Sydney, Australia, <u>www.icsame2021.org</u>

#### **03 80**

#### LATAM 2021 - IX LARMS Latin American Congress on Rock Mechanics, Rock Testing and Site Characterization 20-22 September 2021, Asuncion, Paraguay

#### Symposium Themes

- Site characterization
- Rock mass properties
- Rock mass classification
- Foundations
- Slopes
- Tunnels
- Soft Rock
- Shotcrete

Contact Person:Jose Pavon MendozaAddress:Espana 959 casi WashingtonTelephone:+595 971 909165E-mail:jose.pavonm@gmail.com

**(36 50)** 

Eurock 2022 Rock and Fracture Mechanics in Rock Engineering and Mining 13-16 June 2022, Helsinki, Finland <u>lauri.uotinen@aalto.fi</u>

**03 80** 

3<sup>rd</sup> European Conference on Earthquake Engineering & Seismology, 19 – 24 June 2022, Bucharest, Romania, <u>https://3ecees.ro</u>

**CS 80** 

![](_page_12_Picture_45.jpeg)

#### UNSAT2022 8<sup>th</sup> International Conference on Unsaturated Soils June or September 2022, Milos island, Greece

**03 80** 

![](_page_13_Picture_2.jpeg)

A joint event of the 17th European Conference on Earthquake Engineering & 38th General Assembly of the European Seismological Commission International Conference Centre, Bucharest, Romania. 19 - 24 June 2022

#### 19 to 24 July 2022, Bucharest, Romania https://3ecees.ro

The Romanian Association for Earthquake Engineering, with the support of Technical University of Civil Engineering of Bucharest (UTCB) and National Institute for Earth Physics (INFP), will organize with commitment and motivation the Third European Conference on Earthquake Engineering and Seismology (3ECEES), in 2022 in Bucharest, Romania.

Through Bucharest 3ECEES, we are fully motivated and committed to promote the values of earthquake engineering and seismology for the benefit of human kind, to boost the European cooperation in these fields, to push the frontiers of knowledge and to equip the decision makers and building officials with the roadmap for the years to come aiming at seismic risk reduction and enhanced societal resilience.

We, hereby, declare that we will do our best to make sure that the 3ECEES will be properly organized in 2022 by Romania and will be an outstanding scientific event fully adhering to the highest standards of quality set up by both EAEE and ESC.

We will be delighted to welcome you all in our wonderful country!

#### Topics

The Third European Conference on Earthquake Engineering and Seismology (3ECEES) is aiming at providing a creative and stimulating environment for sharing and tackling the most challenging topics of global importance and interest in Earthquake Engineering and Seismology, such as (the list is neither exhaustive, nor restrictive):

- Physics of earthquakes and Seismic Sources
- Seismicity Analysis
- Induced and Triggered Seismicity
- Engineering Seismology and Strong Ground Motion
- Big Data and Large Research Infrastructures
- Geotechnical Earthquake Engineering
- Seismic Hazard
- Site Effects and Microzonation Studies
- Seismic Analysis and Design of Buildings and Structure
- Seismic Evaluation and Rehabilitation of Buildings and Structure
- Performance Based Design of Buildings and Structures
- Seismic Design Codes
- Lifeline Earthquake Engineering

- Structural Health Monitoring
- Seismic Exposure, Fragility and Risk
- Seismic Resilience
- Lessons from recent earthquakes

#### **Contact Info**

Telephone: +40 740 769 306 Email: <u>contact@3ecees.ro</u>

**(38 )** 

15th ISRM International Congress in Rock Mechanics 9-14 October 2023, Salzburg, Austria salzburg@oegg.at

### ΕΝΔΙΑΦΕΡΟΝΤΑ -ΣΕΙΣΜΟΙ

#### Ο περἰεργος λόγος που οι αρχαἰοι Ἐλληνες ἐχτιζαν ναοὑς πἀνω σε σεισμικὰ ρἡγματα

Γεωπιστήμονας εξηγεί στο BBC.

![](_page_14_Picture_3.jpeg)

Τον λόγο που οι αρχαίοι Έλληνες έχτιζαν ναούς πάνω σε σεισμικά ρήγματα προσπάθησε να εξηγήσει Βρετανός γεωεπιστήμονας.

Ο λόγος για τον καθηγητή και γεωπιστήμονα Ιαν Στιούαρτ, διευθυντή του Ινστιτούτου Βιώσιμης Γης του Πανεπιστημίου του Πλίμουθ, ο οποίος σε έρευνά του που ανέλυσε σε σχετικό ντοκιμαντέρ στο BBC εξηγεί γιατί οι πρόγονοί μας επέμεναν να χτίζουν ναούς και άλλα αγάλματα ως ένδειξη λατρείας σε περιοχές που γνώριζαν ότι έχουν «χτυπηθεί» από σεισμούς.

Στη μελέτη του ο Ιαν Στιούαρτ υποστήριξε πως ο σεισμός για τους αρχαίους είχε ιερή και θεϊκή προέλευση γι' αυτό και επέμεναν να χτίζουν ναούς σε σεισμογενείς περιοχές.

![](_page_14_Picture_7.jpeg)

#### Οι Δελφοί και τα ενεργά ρήγματα

Ο Στιούαρτ βασίστηκε στην θεωρία παλιών επιστημόνων οι οποίοι είχαν αναφέρει πως οι Δελφοί έγιναν ιερό μέρος για τους αρχαίους επειδή υπήρχε μια ιερή πηγή που εκλύονταν από ένα σεισμικό ρήγμα.

Χαρακτηριστικό παράδειγμα είναι το γεγονός ότι παρ' οτι ένας σεισμός κατέστρεψε το ιερό των Δελφών το 373 π.Χ., ο ναός κτίσθηκε ξανά στο ίδιο σημείο.

Ο Στιούαρτ θεωρεί όμως ότι οι Δελφοί δεν αποτελούσαν εξαίρεση και ότι άλλες τοποθεσίες όπως οι Μυκήνες, η Έφεσος, η Κνίδος και η Ιεράπολις είχαν επίσης αποκτήσει ξεχωριστό «στάτους» εξαιτίας της παρουσίας γειτονικών ρηγμάτων.

Όπως είχε δηλώσει στο BBC «πάντα θεωρούσα ότι ήταν κάτι περισσότερο από σύμπτωση το γεγονός πως πολλές σημαντικές τοποθεσίες στον κόσμο του Αιγαίου βρίσκονται ακριβώς πάνω από ρήγματα που προκλήθηκαν λόγω σεισμικής δραστηριότητας.

Οι αρχαίοι Έλληνες απέδιδαν μεγάλη αξία στις θερμοπηγές που δημιουργούνται από σεισμούς, ίσως, όμως η κατασκευή ναών και πόλεων κοντά σε αυτά τα μέρη να ήταν πιο συστηματική από ό,τι είχε προηγουμένως θεωρηθεί».

![](_page_14_Picture_15.jpeg)

#### Οι ναοί και οι θερμοπηγές

Στην μελέτη του είχαν καταγραφεί αντιστοιχίες μεταξύ ενεργών ρηγμάτων και αρχαίων ελληνικών πόλεων τόσο στην Ελλάδα όσο και στην αντίπερα όχθη του Αιγαίου, στη σημερινή δυτική Τουρκία.

«Οι αρχαίοι Έλληνες ήσαν απίστευτα έξυπνοι άνθρωποι και πιστεύω πως θα είχαν αναγνωρίσει αυτή τη σημασία των σεισμών και θα ήθελαν οι πολίτες τους να επωφεληθούν από αυτούς» κατέληξε ο Στιούαρτ.

(<u>in.gr</u>, 11 Σεπτεμβρίου 2019, <u>https://www.in.gr/2019/09/11/tech/o-periergos-logos-pou-</u> <u>oi-arxaioi-ellines-extizan-naous-pano-se-seismika-rigmata</u>)

### Earthquake faults may have played key role in shaping the culture of ancient Greece

#### by University of Plymouth

The Ancient Greeks may have built sacred or treasured sites deliberately on land previously affected by earthquake activity, according to a new study by the University of Plymouth.

Professor of Geoscience Communication Iain Stewart MBE, Director of the University's Sustainable Earth Institute, has presented several BBC documentaries about the power of earthquakes in shaping landscapes and communities.

Now he believes fault lines created by seismic activity in the Aegean region may have caused areas to be afforded special cultural status and, as such, led to them becoming sites of much celebrated temples and great cities.

Scientists have previously suggested Delphi, a mountainside complex once home to a legendary oracle, gained its position in Classical Greek society largely as a result of a sacred spring and intoxicating gases which emanated from a fault line caused by an earthquake.

But Professor Stewart believes Delphi may not be alone in this regard, and that other cities including Mycenae, Ephesus, Cnidus and Hierapolis may have been constructed specifically because of the presence of fault lines.

Professor Stewart said: "Earthquake faulting is endemic to the Aegean world, and for more than 30 years, I have been fascinated by the role earthquakes played in shaping its landscape. But I have always thought it more than a coincidence that many important sites are located directly on top of fault lines created by seismic activity. The Ancient Greeks placed great value on hot springs unlocked by earthquakes, but perhaps the building of temples and cities close to these sites was more systematic than has previously been thought."

In the study, published in Proceedings of the Geologists' Association, Professor Stewart says a correspondence of active faults and ancient cities in parts of Greece and western Turkey might not seem unduly surprising given the Aegean region is riddled with seismic faults and littered with ruined settlements.

But, he adds, many seismic fault traces in the region do not simply disrupt the fabric of buildings and streets, but run straight through the heart of the ancient settlements' most sacred structures.

There are prominent examples to support the theory, such as in Delphi itself where a sanctuary was destroyed by an earthquake in 373BC only for its temple to be rebuilt directly on the same fault line.

There are also many tales of individuals who attained oracular status by descending into the underworld, with some commentators arguing that such cave systems or grottoes caused by seismic activity may have formed the backdrop for these stories.

Professor Stewart concludes: "I am not saying that every sacred site in ancient Greece was built on a fault line. But while our association with earthquakes nowadays is that they are all negative, we have always known that in the long run they give more than they take away. The ancient Greeks were incredibly intelligent people and I believe they would have recognised this significance and wanted their citizens to benefit from the properties they created."

More information: Iain S. Stewart, Seismic faults and sacred sanctuaries in Aegean antiquity, Proceedings of the Ge-Association (2017). DOI: ologists' 10.1016/j.pge-<u>ola.2017.07.009</u>

(PHYS) ORC, September 12, 2017, https://phys.org/news/2017-09-earthquake-faults-key-roleculture.html)

#### Seismic faults and sacred sanctuaries in Aegean antiquity

#### Iain S. Stewart and Luigi Piccardi

#### Abstract

The ancient destructive capability of earthquake faults is well chronicled by historians and their cultural impact widely uncovered by archaeologists. Archaeological and geological investigations at some of the most renowned sites in the ancient Greece world, however, suggest a more nuanced and intimate relationship between seismic faults and past human

settlements. In the Aegean's karstic landscape earthquake fault scarps act as limestone ramparts on which fortifications, citadels and acropoli were constructed, and underlying fault lines were preferred pathways for groundwater movement and egress. The vital purifactory or therapeutic role of natural springs in the ritual practices of early settlements implies that the fault lines from which they leaked may have helped position the nascent hubs of Greek cities. Equally, the tendency for earthquakes to disrupt groundwater patterns and occasionally shut down persistent springs provides a hitherto unrecognized mechanism for the abrupt demise of those same settlements. Votive niches, carvings, reliefs and inscriptions on fault surfaces suggest important sacred sanctuaries, particularly those with oracular functions, may have been deliberately built astride active fault traces and venerated as direct connections to the chthonic realm ('the underworld'). Regionally, the Aegean's distributed network of tensional faulting, circulating geothermal waters and deep-seated de-gassing sets the tectonic framework for the springs and gases that infuse the ancient Greek netherworld of caves, chasms, chambers, and sacred grottos. The possibility that seismic faults may have constituted the fulcrum of prominent sacred places means that, for all their obvious destructiveness, earthquakes may have had an unacknowledged cultural significance in Greek antiquity.

#### 1. Introduction

Throughout human history in the eastern Mediterranean region, urban settlements have co-existed with earthquakes (de Boer and Sanders, 2006). The destructive capability of seismic activity is well chronicled by historians (Ambraseys, 1971, Guidoboni et al., 1994), and its cultural wreckage widely uncovered by archaeologists (Karcz and Kafri, 1978, Rapp, 1986, Nikonov, 1988, Stiros and Jones, 1996, Sintubin et al., 2010, Jusseret and Sintubin, 2017). Accounts and observations of seismic damage to ancient constructions and relics offer partial information on the size, location and date of ancient earthquakes (Sintubin and Stewart, 2008). Buildings and structures damaged by shaking or offset across faults provide archaeological markers that can shed light on the slip history of possible seismogenic sources (e.g. Galli and Galadini, 2003, Korjenkov et al., 2003, Passchier et al., 2013) and can inform regional seismic hazard (Sintubin et al., 2008, Jusseret, 2014, Jusseret and Sintubin, 2012, Jusseret et al., 2013).

Any tendency for active faults to disrupt former urban settlements might seem to be an unfortunate situation that arose spuriously as a consequence of past populations, ignorant of seismic threats, being unwarily drawn to these invisible axes of destruction. The lure of these lethal corridors of land reflected the surprising advantages that tectonically active belts offer; active faults can create and sustain attractive conditions for human development, sustaining dynamic landscapes in which recent tectonics 'frame' patterns of human land use (Bailey et al., 1993, King et al., 1994, King and Bailey, 2010). Groundwater leakage and sediment build up along young fault lines provide well-watered corridors of land, leading some to conjecture that active tectonic zones seeded the earliest centres of Neolithic agriculture (Trifonov and Karakhanian, 2004) and even of early civilisations (Force, 2008, Force and McFadgen, 2010, Force and McFadgen, 2012). Moreover, the tendency for active fault lines to provide persistent groundwater egress and fertile land over millennia lies at the root of the 'fatal attraction' that today finds many populous towns and cities across the eastern Mediterranean and Near East lying directly above seismically dangerous faults (Jackson, 2005).

In this paper, an association between active faults and ancient places is examined in the context of some of the most prominent sites of Greek antiquity. A close correspondence of active faults and ancient cities here is not unduly surprising - the Aegean region is riddled with seismic faults and littered

with ruined settlements, so some casual correlation is to be expected. But the correlation is more than simply a contiguous association - across central Greece and western Turkey many seismic fault traces do not simply disrupt the palaeourban fabric of buildings and streets but rather they penetrate into the heart of ancient settlements to break or disrupt important sacred structures (Piccardi, 2001). At Priene on the Menderes graben in western Turkey, for example, a narrow corridor of seismic damage cuts the Hellenistic city centre, rupturing a series of public buildings that include the Sacred Stoa (Altunel, 1998, Altunel, 1999; Yonlu et al. 2010). Further south, the expansive Greco-Roman remains of Sagalassos sprawl in front of an active fault escarpment, with the most recent fault splay cutting the temple complex in the centre of the city (Sintubin et al., 2003, Similox-Tohon et al., 2006). In the following sections, the key relations between seismic faults and sacred sanctuaries in the wider Aegean region are set out, and the implications for earthquakes as a pervasive cultural influence in antiquity are discussed.

...

![](_page_16_Picture_2.jpeg)

Fig. 1. Repeated earthquake faulting in the limestone terrain of Greece and Western Turkey form distinctive fault scarps sllong the edges of many alluvial plains. These limstone fault scarps serve as natural ramparts on top of which fortifications, citadels and acropoli were constructe and are often lines of preferential spring egress.

#### https://doi.org/10.1016/j.pgeola.2017.07.009

https://www.sciencedirect.com/science/article/pii/S0016787817301190

#### **03 80**

#### Earthquake protection in Kamchatka

Με την ευκαιρία της επετείου των 20 χρόνων από τον σεισμό της Πάρνηθας-Αθήνας 1999, το μέλος της ΕΕΕΕΓΜ Ομότιμος Καθηγητής ΕΜΠ Παύλος Μαρίνος έστειλε το παρακάτω απόσπασμα από το βιβλίο «Από την χερσόνησο της Σαχαλίνης», T. Waltham, World of Geology, Whittles publ, 2019:

Astride the boundary where the Pacific Ocean plate dives beneath the Eurasian continent, the inhabitants of Russia's Kamchatka Peninsula live with a perpetual threat of seismic activity. Annual plate convergence of around 80 mm generates earthquakes along the eastern coast, as well as fuelling the line of active volcanoes that lie just inland. Most of the peninsula is sparsely populated wilderness, but Petropavlosk is a major city that is spread round the shores of Avacha Bay. This bay provides one of the world's finest natural harbours, but it is set into the seismically active eastern coast. The current prediction is that a nearby earthquake of Magnitude 7 will impact the bay and the city with intensity up to IX about every 60 years. That constitutes a significant threat to the city's buildings, where thousands of people live in apartment blocks that are typically four to six storeys high.

![](_page_16_Picture_11.jpeg)

Η πηγή της φωτογραφίας: Από την χερσόνησο της Σαχαλίνης: Τ. Waltham, World of Geology, Whittles publ, 2019.

Most of the more modern blocks have been designed and built with internal shear-walls as part of their structure. These are reinforced elements that are capable of resisting the shear forces induced by lateral vibrations during an earthquake; their effects is similar to that of the diagonal bracing that is developed as an external architectural feature on some modern earthquake-proof office blocks. However, some of Petropavlosk's older apartment blocks lack any shearwalls, so these blocks have been retrofitted with shear-resistant elements. External ribs of reinforced concrete are tied together with tensioned steel cables across the roof and through the foundations. These might not be attractive, but they should be effective in preventing the relatively flimsy walls from being pushed over, which could cause the concrete floor slabs to pancake on top of each other. That style of collapse is the cause of innumerable fatalities during earthquake events in many parts of the world. With the hazard of seismic collapse of their apartment blocks now reduced, the residents of Petropavlosk need only fear earthquake-induced landslides within their hilly city, or perhaps an eruption of either of the potentially explosive volcanoes of Koryaksky and Avacha that loom over the back of the city. In geological terms, Petropavlosk is an exciting place to live.

### ΕΝΔΙΑΦΕΡΟΝΤΑ -ΓΕΩΛΟΓΙΑ

#### Αδρία: Μια πραγματική χαμένη ήπειρος, θαμμένη κάτω από τη Νότια Ευρώπη και τη Μεσόγειο

Η μυθική χαμένη ήπειρος Ατλαντίδα έχει το διάσημο όνομα, αλλά η Αδρία είναι μια πραγματική χαμένη ήπειρος, που είναι θαμμένη σε μεγάλο βαθμό κάτω από τη Νότια Ευρώπη και τη Μεσόγειο, συνεπώς κάτω και από την Ελλάδα

![](_page_17_Figure_3.jpeg)

Η Ευρύτερη Αδρία ανήκε στην αφρικανική τεκτονική πλάκα, αλλά δεν αποτελούσε μέρος της Αφρικής, καθώς ένας ωκεανός χώριζε τις δύο ηπείρους

Η μυθική χαμένη ήπειρος Ατλαντίδα έχει το διάσημο όνομα, αλλά η Αδρία είναι μια πραγματική χαμένη ήπειρος, που είναι θαμμένη σε μεγάλο βαθμό κάτω από τη Νότια Ευρώπη και τη Μεσόγειο, συνεπώς κάτω και από την Ελλάδα.

Πρώτη φορά οι γεωλόγοι πιστεύουν ότι είναι σε θέση να ανακατασκευάσουν πια αρκετά ολοκληρωμένα την ιστορία της χαμένης ηπείρου, διάρκειας σχεδόν 250 εκατομμυρίων ετών, μελετώντας τα λιγοστά απομεινάρια της που είναι ακόμη πάνω από την επιφάνεια.

Σήμερα από τη λεγόμενη Ευρύτερη Αδρία έχουν απομείνει ορατά μόνο ορισμένα ασβεστολιθικά και άλλα πετρώματα στις οροσειρές της Νότιας Ευρώπης. Οι επιστήμονες πιστεύουν ότι αυτοί οι βράχοι αρχικά ήταν θαλάσσια ιζήματα, που κάποια στιγμή ανυψώθηκαν μέσω της σύγκρουσης των τεκτονικών πλακών.

Οι ερευνητές, με επικεφαλής τον ολλανδό γεωλόγο Ντάου βαν Χινσμπέργκεν του Τμήματος Γεωεπιστημών του Πανεπιστημίου της Ουτρέχτης, που έκαναν τη σχετική δημοσίευση στο περιοδικό Gondwana Research, σύμφωνα με το Science, αφιέρωσαν πάνω από δέκα χρόνια κυρίως στη Μεσόγειο, συλλέγοντας δείγματα και μελετώντας παλαιομαγνητικά και άλλα στοιχεία για πετρώματα που θεωρείται ότι προέρχονται από την Αδρία.

Η Ευρύτερη Αδρία φαίνεται πως είχε μια βίαιη και πολύπλοκη ιστορία. Κάποια εποχή, πριν από περίπου 240 εκατομμύρια χρόνια, αυτονομήθηκε από τη νότια υπερήπειρο Γκοντβάνα (που κάλυπτε την περιοχή της σημερινής Αφρικής, Νότιας Αμερικής, Αυστραλίας, Ανταρκτικής, Ινδίας και Αραβικής χερσονήσου) και άρχισε να μετακινείται βορειότερα.

Ήταν περισσότερο ένα αρχιπέλαγος νησιών, «μια περιοχή κατάλληλη για καταδύσεις», σύμφωνα με τον Χινσμπέργκεν. Πριν από 140 εκατομμύρια χρόνια είχε περίπου το μέγεθος της Γροιλανδίας και σε μεγάλο βαθμό ήταν βυθισμένη κάτω από μια ρηχή τροπική θάλασσα, όπου σταδιακά συσσωρεύτηκαν ιζήματα και αργά μετατράπηκαν σε πετρώματα.

Η Ευρύτερη Αδρία ανήκε στην αφρικανική τεκτονική πλάκα, αλλά δεν αποτελούσε μέρος της Αφρικής, καθώς ένας ωκεανός χώριζε τις δύο ηπείρους.

Στη συνέχεια, καθώς η Αδρία συγκρούστηκε με τη μάζα ξηράς που αποτελεί σήμερα την Ευρώπη, με ρυθμό έως τεσσάρων εκατοστών ετησίως, κάτι που συνέβη πριν από 100 έως 120 εκατομμύρια χρόνια, έσπασε σε κομμάτια και βυθίστηκε.

Μόνο ένα μέρος των πάχους 100 χιλιομέτρων πετρωμάτων της Ευρύτερης Αδρίας παρέμεινε στην επιφάνεια της Γης, και σήμερα οι γεωλόγοι το αναζητούν κυρίως στη Νότια Ευρώπη.

Τα πετρώματα αυτά πιστεύεται ότι είναι διεσπαρμένα σε πάνω από 30 χώρες (και στην Ελλάδα), από την Ισπανία και τις Άλπεις μέχρι το Ιράν.

Μέχρι πρόσφατα οι γεωλόγοι δεν είχαν το εξελιγμένο λογισμικό που θα τους επέτρεπε να συνθέσουν τα διαθέσιμα στοιχεία και να αναπαραστήσουν σε υπολογιστή την ιστορία της Αδρίας, πολύ περισσότερο που, κατά τον Χινσμπέργκεν, «η περιοχή της Μεσογείου είναι απλούστατα ένα γεωλογικό χάος».

Η νέα μελέτη κάνει ένα σημαντικό βήμα προς αυτήν την κατεύθυνση.

Εκτιμάται ότι σήμερα τμήματα της Αδρίας βρίσκονται σε βάθος έως 1.500 χιλιομέτρων κάτω από την επιφάνεια της Μεσογείου.

(Πηγή πληροφοριών: ΑΠΕ – ΜΠΕ)

(<u>in.gr</u>, 12 Σεπτεμβρίου 2019, https://www.in.gr/2019/09/12/tech/adria-mia-pragmatikixameni-ipeiros-thammeni-kato-apo-ti-notia-eyropi-kai-timesogeio)

#### Geologists uncover history of lost continent buried beneath Europe

Most of "Greater Adria" is now trapped in Earth's mantle, but some of its rocks ended up high in the Alps

![](_page_17_Figure_23.jpeg)

About 140 million years ago, Greater Adria-which later got shoved beneath southern Europe-was a Greenland-size landmass (submerged portions in gray-green) south of the continent.

Van Hinsbergen et al., Gondwana Research (2019)

Forget the legendary lost continent of Atlantis. Geologists have reconstructed, time slice by time slice, a nearly quarterof-a-billion-year-long history of a vanished landmass that now lies submerged, not beneath an ocean somewhere, but largely below southern Europe.

The researchers' analysis represents "a huge amount of work," says Laurent Jolivet, a geologist at Sorbonne University in Paris who was not involved in the new study. Although the tectonic history of the landmass has been generally known for a few decades, he says, "[T]he amount of detail in the team's systematic time-lapse reconstruction is unprecedented."

The only visible remnants of the continent—known as Greater Adria—are limestones and other rocks found in the mountain ranges of southern Europe. Scientists believe these rocks started out as marine sediments and were later scraped off the landmass's surface and lifted up through the collision of tectonic plates. Yet the size, shape, and history of the original landmass—much of which lay beneath shallow tropical seas for millions of years—have been tough to reconstruct.

For starters, Greater Adria had a violent, complicated history, notes Douwe van Hinsbergen, a geologist at Utrecht University in the Netherlands. It became a separate entity when it broke away from the southern supercontinent of Gondwana (which comprised what is today Africa, South America, Australia, Antarctica, the Indian subcontinent, and the Arabian Peninsula) about 240 million years ago and started to move northward, scientists believe. About 140 million years ago, it was a Greenland-size landmass, largely submerged in a tropical sea, where sediments collected and slowly turned into rock. Then, as it collided with what is now Europe between 100 million and 120 million years ago, it shattered into pieces and was shoved beneath that continent. Only a fraction of Greater Adria's rocks, scraped off in the collision, remained on Earth's surface for geologists to discover.

Another complication is that Greater Adria's rocks are dispersed across more than 30 countries, in a swath from Spain to Iran. So, like the rocks themselves, data have been scattered and thus are difficult to collect, van Hinsbergen says. And finally, he notes, until the past decade or so geologists haven't had the sophisticated software needed to perform such byzantine reconstructions. "The Mediterranean region is quite simply a geological mess," he says. "Everything is curved, broken, and stacked."

In the new study, van Hinsbergen and his colleagues spent more than 10 years collecting information about the ages of rock samples thought to be from Greater Adria, as well as the direction of any magnetic fields trapped in them. That let the researchers identify not just when, but where, the rocks were formed.

Rather than simply moving north with no change in its orientation, Greater Adria spun counterclockwise as it jostled and scraped past other tectonic plates, van Hinsbergen's team reports this week in *Gondwana Research*. Although the tectonic collision happened at speeds of no more than 3 to 4 centimeters per year, the inexorable smash-up shattered the 100-kilometer-thick bit of crust and sent most of it deep within Earth's mantle, van Hinsbergen says.

The study is not the only evidence for Greater Adria as a lost continent. Other researchers who use seismic waves to generate computerized tomography-like images of structures deep within Earth have created an "atlas of the underworld"—a graveyard of slabs of crust that have sunk into the mantle. This research shows that portions of Greater Adria now lie as much as 1500 kilometers below our planet's surface.

Posted in: Earth, doi:10.1126/science.aaz4156

(Sid Perkins / ScienceMag, Sep. 6, 2019, <u>https://www.sci-encemag.org/news/2019/09/geologists-uncover-history-lost-continent-buried-beneath-europe</u>)

#### Orogenic architecture of the Mediterranean region and kinematic reconstruction of its tectonic evolution since the Triassic

Douwe J.J.van Hinsbergen, Trond H.Torsvik, Stefan M. Schmid, Liviu C. Maţenco, Marco Maffione, Reinoud L.M. Vissers, Derya Gürer, Wim Spakman

#### Highlights

- First GPlates reconstruction of the Mediterranean region.
- Modern orogenic architecture of the Mediterranean region and its tectonic evolution since the Triassic reviewed and restored.
- 2300 paleomagnetic sites compiled and analyzed.
- 12 Paleo-Tectonic maps of the Mediterranean region since 240 Ma presented.
- No correlation between continental subduction and upper plate deformation style, or upper plate shortening and downgoing plate composition.

![](_page_18_Picture_18.jpeg)

#### Abstract

The basins and orogens of the Mediterranean region ultimately result from the opening of oceans during the early break-up of Pangea since the Triassic, and their subsequent destruction by subduction accommodating convergence between the African and Eurasian Plates since the Jurassic. The region has been the cradle for the development of geodynamic concepts that link crustal evolution to continental break-up, oceanic and continental subduction, and mantle dynamics in general. The development of such concepts requires a first-order understanding of the kinematic evolution of the region for which a multitude of reconstructions have previously been proposed. In this paper, we use advances made in kinematic restoration software in the last decade with a systematic reconstruction protocol for developing a more quantitative restoration of the Mediterranean region for the last 240 million years. This restoration is constructed for the first time with the GPlates plate reconstruction software and uses a systematic reconstruction protocol that limits input data to marine magnetic anomaly reconstructions of ocean basins, structural geological constraints quantifying timing, direction, and magnitude of tectonic motion, and tests and iterations against paleomagnetic data. This approach leads to a reconstruction that is reproducible, and updatable with future constraints. We first review constraints on the opening history of the Atlantic (and Red Sea) oceans and the Bay of Biscay. We then provide a comprehensive

overview of the architecture of the Mediterranean orogens, from the Pyrenees and Betic-Rif orogen in the west to the Caucasus in the east and identify structural geological constraints on tectonic motions. We subsequently analyze a newly constructed database of some 2300 published paleomagnetic sites from the Mediterranean region and test the reconstruction against these constraints. We provide the reconstruction in the form of 12 maps being snapshots from 240 to 0 Ma, outline the main features in each time-slice, and identify differences from previous reconstructions, which are discussed in the final section.

https://doi.org/10.1016/j.gr.2019.07.009Get rights and content

(Science Rirect, 3 September 2019, <u>https://www.sciencedi-rect.com/science/article/pii/S1342937X19302230</u>, open access)

**(38 )** 

#### Pobiti Kamani; The Stone Forest in Bulgaria

About 18 km to the west of Varna, Bulgaria, on the road to the capital of Sofia is a remarkable natural area called Pobiti Kamani or the Stone Forest. At first glance, it looks like the ruins of an ancient temple, but these broken stone pillars are all natural.

![](_page_19_Picture_6.jpeg)

![](_page_19_Picture_7.jpeg)

The stone columns are distributed in small groups across an 8 km long belt along the northern Bulgarian Black Sea coast. They vary in height with some reaching 5 to 7 meters tall, and thickness ranging from 30 centimeters to 3 meters across. The most curious thing about these pillars is that they are mostly hollow and filled with sand. They don't have a solid foundation or attached to the bedrock. Instead, they are

loosely stuck into the surrounding sand as if some one had hammered them into the earth.

![](_page_19_Picture_10.jpeg)

![](_page_19_Picture_11.jpeg)

The stones have been known since the ancient times but were first documented by the scientific community in 1828. Since then, dozens of theories have attempted to explain their formation, ranging from coral growth to Eocene bubbling reefs, to limestone concretions.

One of the most plausible explanation comes from the Bulgarian geologists brothers Peter and Stefan Bonchev Gochev. The brothers believe that the columns date back to the Cenozoic Era, about 50 million years ago, when much of Eastern Europe was covered by oceans. Sediments and sludge settled to the bottom of the seabed, and were compressed into limestone. Some time later methane gases from ancient deposits started seeping from the sea bed. As the pressurized gases made their way up through the limestone layer, they left behind long tubes. Millions of years later after the sea receded away, erosion of the limestone layer left the tall columns stuck into the ground. The gas-seepage theory doesn't explain everything, but it's the best we have.

Pobiti Kamani was designated a natural landmark in the late 1930s. It was nominated for the UNESCO World Heritage Site status in 2011, but hasn't been able to make the cut.

https://www.facebook.com/groups/1383862988363754/permalink/2309032175846826/

(από το μέλος της ΕΕΕΕΓΜ Γιάννη Μεταξά)

#### **(3 %)**

#### Angel Falls and Mount Roraima, Venezuela

#### **Geological wonders**

#### The lakes of Band-e Amir National Park, Afghanistan

![](_page_20_Picture_4.jpeg)

It is a series of six deep blue lakes separated by natural dams made of travertine, a mineral deposit. The lakes are situated in the Hindu Kush mountainsat approximately 3000 m of elevation, west of the famous Buddhas of Bamiyan.

They were created by the carbon dioxide rich water oozing out of the faults and fractures to deposit calcium carbonate precipitate in the form of travertine walls that today store the water of these lakes. Band-e Amir is one of the few rare natural lakes in the world which are created by travertine systems. The site of Band-e Amir has been described as Afghanistan's Grand Canyon, and draws thousands of tourists a year. The river is part of the system of the Balkh River.

![](_page_20_Picture_7.jpeg)

![](_page_20_Picture_8.jpeg)

**Angel Falls** are located in **Venezuela** and are **famous** for being one of the four most beautiful **waterfalls** in the world, and as the highest uninterrupted **waterfalls** in the world. The **falls** got their name **Angel Falls** after a US aviator became the first person to fly over the **falls** in the mid-20<sup>th</sup> century.

![](_page_20_Picture_10.jpeg)

Ennedi Plateau, Chad

![](_page_20_Picture_12.jpeg)

Στο βορειοανατολικό τμήμα του Chad, ένα φυσικό αριστούργημα από ψαμμίτη εκτείνεται σε 40,000 km<sup>2</sup>, δημιουργώντας ένα μοναδικό φυσικό ανάγλυφο, που χαρακτηρίζεται από γκρεμούς, φαράγγια και φυσικές καμάρες.

Χαρακτηρισμένο ως Εδέμ της Σαχάρας, το οροπέδιο Ennedi συμπεριλήφθηκε από την UNESCO στα Μνημεία Παγκόσμιας Πολιτιστικής Κληρονομιάς το 2016 για τους μοναδικούς φυσικούς σχηματισμούς και τα έργα τέχνης που είναι σκαλισμένα στους βράχους και χρονολογούνται πριν από 7,000 χρόνια.

![](_page_21_Picture_1.jpeg)

http://publications.americanalpineclub.org/articles/1220112 1500/Africa-Chad-Ennedi-Desert-Various-Ascents

![](_page_21_Picture_3.jpeg)

https://www.telegraph.co.uk/travel/galleries/worldwonders-too-dangerous-to-visit/ennedi-plateau/

Η πιο διάσημη λίμνη στη Σαχάρα είναι η Guelta d'Archei, που βρίσκεται στο ποτάμι του φαραγγιού όπου ποιμένες και νομάδες Tubu ή Toubou, μια εθνική ομάδα που κατοικεί κυρίως στο βόρειο Chad, ποτίζουν τις αγέλες από καμήλες δρομείς

The Ennedi Plateau: Secret Stones of the Sahara

![](_page_21_Picture_7.jpeg)

Rising from the sands of the great Sahara Desert, the Ennedi Plateau is a revelation. Situated in the north east of Chad and surrounded by sand on all sides, this extraordinary, other-worldly place presents vista after vista of stunning rock formations. Ennedi is little visited – there is nothing you could realistically call a road for many miles. The plateau is frequented only by local nomads and a handful of foreign visitors in their 4x4s.

Yet even though the landscape resembles somewhere the crew of the Enterprise might find themselves on an away mission, these rocks – as you will see - hide something perhaps even more astonishing.

![](_page_21_Picture_11.jpeg)

A journey to the Ennedi Plateau is not for the casual traveler or the faint-hearted. It is a four day drive from the capital city of this landlocked country, N'Djamena. The name of the capital translates from the Arabic as place of rest but that is probably the last thing a visitor gets on the 100 hour journey to Ennedi along dusty and pot-holed roads. However, the country is truly a crossroads of civilizations with over 200 linguistic and ethnic groups.

![](_page_21_Picture_13.jpeg)

![](_page_22_Picture_0.jpeg)

![](_page_22_Picture_1.jpeg)

![](_page_22_Picture_2.jpeg)

![](_page_22_Picture_3.jpeg)

On arrival at the Ennedi Plateau you may on occasion cross paths with nomadic camel herders. Unsurprisingly, the place is a magnet for the hardiest of the world's rock-climbers who come here to ascend the sandstone rocks, many of which are over a hundred meters in height. One can only imagine the bemusement of the locals.

However, even 4x4s cannot manage a lot of the terrain that you see in these pictures. Often, vehicles must be left behind. Yet after trekking for several hours the rewards are manifold. The rock formations sweep towards the sky in a multitude of incredible shapes and sizes. It looks barren and devoid of life but nature always seems to find a way.

![](_page_22_Picture_6.jpeg)

It is easy to forget that the plateau is surrounded by sand - until you see the Sahara.

![](_page_22_Picture_8.jpeg)

You might think the occasional tree could just about flourish here.

![](_page_22_Picture_10.jpeg)

![](_page_23_Picture_0.jpeg)

![](_page_23_Picture_1.jpeg)

Even in the middle of the harsh, dry desert lush *gueltas* can be found. These are areas of wetland where subterranean water spills gloriously to the surface. Here you might catch a glimpse of the elusive and extremely rare dwarf Nile Crocodile. The Ennedi tiger and Saharan lion are, unfortunately, both believed now to be extinct. Perhaps good news for the camels, however, who flock to these river canyons to fill up their tanks before journeying back in to the desert.

![](_page_23_Picture_3.jpeg)

Yet its remote location is not the only thing which deters visitors. Chad is considered a failed state, an unfortunate place benighted by political corruption and poverty with the greater part of its 10 million population scraping a subsistence living

from the land. Tourists are at some risk of robbery and violence if they choose to travel alone and unprotected through this remarkable, beautiful but potentially perilous country.

![](_page_23_Picture_6.jpeg)

![](_page_23_Picture_7.jpeg)

![](_page_23_Picture_8.jpeg)

![](_page_23_Picture_9.jpeg)

![](_page_24_Picture_0.jpeg)

![](_page_24_Picture_1.jpeg)

Yet for all its hazards, the Ennedi Plateau is truly a place of wonder.

Here is Ennedi's final surprise. Neolithic paintings adorn many of the rocks, their shape and color preserved by the dry desert atmosphere. How many thousands of years ago did a culture flourish here, populated by enough people to develop leisure time in which to express themselves through art? We may never know who these people were but their voices travel down through the millennia thanks to their priceless but little seen legacy to the world.

![](_page_24_Picture_4.jpeg)

![](_page_24_Picture_5.jpeg)

https://www.kuriositas.com/2013/10/the-ennedi-plateausecret-stones-of.html

![](_page_24_Picture_7.jpeg)

https://www.bbc.com/news/world-africa-39332438

![](_page_24_Picture_9.jpeg)

![](_page_24_Picture_10.jpeg)

#### https://africanrockart.org/rock-art-gallery/chad/

![](_page_25_Picture_1.jpeg)

https://explore-chad.org/en/the-ennedi-massif

![](_page_25_Picture_3.jpeg)

https://africasustainableconservation.com/2017/03/21/chad-ennedi-cave-paintings-defaced/

Ennedi desert, Chad: Forgotten wonders from the dead heart of Africa

https://www.atlasofwonders.com/2012/07/forgotten-wonders-dead-heart-africa.html

### ΕΝΔΙΑΦΕΡΟΝΤΑ -ΠΕΡΙΒΑΛΛΟΝ

### Ο ἀνθρωπος αλλἀζει το πρόσωπο της Γης εδώ και χιλιἀδες χρόνια

![](_page_26_Picture_2.jpeg)

Όσοι πιστεύουν ότι ο σύγχρονος πολιτισμός έχει την αποκλειστικότητα στη μεταμόρφωση του «προσώπου» του πλανήτη μας, πλανώνται σοβαρά. Εδώ και τουλάχιστον 10.000 χρόνια -και πολύ πιο ορατά εδώ και 3.000 χρόνια- διάφοροι αρχαίοι πολιτισμοί έχουν κάνει άνωκάτω τη Γη, όπως επιβεβαιώνει μία νέα μεγάλη διεθνής επιστημονική έρευνα.

Η μελέτη αποκαλύπτει ότι οι προϊστορικοί ἀνθρωποι είχαν πολύ πιο ευρεία και πολύ πιο πρώιμη επίπτωση στην οικολογία της Γης από ό,τι είχε θεωρηθεί ἑως τώρα, κάτι που ἑρχεται να ανατρἑψει την κυρίαρχη αντίληψη πως το «κακό» είναι πρόσφατο.

Η ικανότητα των ανθρώπων να αλλάζουν κατά βούληση το φυσικό περιβάλλον θεωρείται συχνά ένα μοντέρνο φαινόμενο (αποψίλωση δασών, διάβρωση εδάφους, εκπομπές «θερμοκηniou» κ.ά.). Μάλιστα, μία διεθνής ομάδα γεωλόγων θεωρεί ότι κάπου στα μέσα του 20ού αιώνα άρχισε μία νέα εποχή, η Ανθρωπόκαινος, που ακριβώς χαρακτηρίζεται από το γεγονός ότι για πρώτη φορά η ανθρωπότητα άρχισε να αφήνει το γεωλογικό αποτύπωμά της στη Γη.

Όμως, καθόλου δεν συμφωνούν όλοι οι επιστήμονες με αυτήν την «αφήγηση». Πολλοί θεωρούν ότι η ανθρωπογενής επίδραση είναι μία πολύ παλαιότερη ιστορία, σαφώς αρχαιότερη από την εποχή των πυρηνικών και της κλιματικής αλλαγής. Είναι λάθος, όπως λένε, να φαντάζεται κανείς ότι παλιά -πριν την εμφάνιση της εντατικής γεωργίας, κτηνοτροφίας και βιομηχανίας- οι άνθρωποι έκαναν ό,τι έκαναν, αλλά δεν άφηναν τα ίχνη τους στη Γη.

Στην πραγματικότητα, για παράδειγμα, εδώ και χιλιάδες χρόνια οι πρόγονοί μας έκαιγαν τα δάση για να αναπτύξουν τη γεωργία και την κτηνοτροφία και ακόμη παλαιότερα για να διευκολυνθούν στο κυνήγι μεγάλων ζώων. Απλώς, σήμερα ο ρυθμός της επέμβασης στο περιβάλλον έχει πάρει πιο δραστικές -και δραματικές- μορφές. Mia νέα μελέτη στο κορυφαίο επιστημονικό περιοδικό «Science», η οποία έγινε στο πλαίσιο του διεθνούς προγράμματος ArchaeoGLOBE, που αναλύει τις χρήσεις γης σε έξι ηπείρους διαχρονικά (από το 8.000 π.Χ. έως τη βιομηχανική επανάσταση), με τη συμμετοχή 255 αρχαιολόγων και επιστημόνων από διάφορες χώρες, κατέληξε στο συμπέρασμα ότι αρχικά οι κυνηγοί-τροφοσυλλέκτες και στη συνέχεια οι γεωργοί είχαν αλλάξει σημαντικά το πρόσωπο του πλανήτη μας ήδη πριν 3.000 χρόνια.

Μερικά βασικά ευρήματα της μελέτης:

 Το κυνήγι, η τροφοσυλλογή και το ψάρεμα ήσαν διαδεδομένα στα περισσότερα μέρη του κόσμου πριν 10.000 χρόνια, αλλά πριν 3.000 χρόνια είχαν πια σαφή τάση μείωσης σε πάνω από τις μισές περιοχές της Γης.

 Η κτηνοτροφία και η ποιμενική ζωή είχαν πριν 8.000 χρόνια εξαπλωθεί από την κοιτίδα τους στη Νοτιοδυτική Ασία σε διάφορες περιοχές της Βόρειας Αφρικής και Ευρασίας, όπου είχαν πλέον μεγάλη διάδοση πριν 4.000 χρόνια.

 Πριν 6.000 χρόνια η γεωργία, με τη μία ή την άλλη μορφή, εξασκείτο σχεδόν στον μισό κόσμο και πριν 3.000 χρόνια σχεδόν σε όλον. Σε μερικές περιοχές δεν αντικατέστησε το κυνήγι και την τροφοσυλλογή, αλλά αναπτύχθηκε συμπληρωματικά με αυτά.

«Υπάρχει μία βαθιά ιστορία ανθρωπογενών αλλαγών στον πλανήτη, η οποία όμως ακόμη δεν έχει ενσωματωθεί στον δημόσιο διάλογο και στη μελέτη της αλληλεπίδρασης ανθρώπουπεριβάλλοντος», ανέφερε ο επικεφαλής ερευνητής Λούκας Στέφενς του Πανεπιστημίου της Πενσιλβάνια.

«Είναι πια καιρός να προχωρήσουμε πέρα από το πρόσφατο παράδειγμα της Ανθρωποκαίνου και να αναγνωρίσουμε ότι οι μακρόχρονες αλλαγές, ήδη, από το βαθύ παρελθόν έχουν μεταμορφώσει την οικολογία αυτού του πλανήτη», δήλωσε ο περιβαλλοντικός επιστήμονας Ερλ Έλις του Πανεπιστημίου του Μέριλαντ στη Βαλτιμόρη.

«Η ιδέα του να βλέπουμε τις ανθρώπινες επιπτώσεις στο περιβάλλον ως ένα νεότερο φαινόμενο εστιάζει υπερβολικά στο πρόσφατο παρελθόν», υπογράμμισε ο ανθρωπολόγος Γκάρι Φάινμαν του αμερικανικού Mouσείου Field και τόνισε ότι «για να κατανοήσουμε την τωρινή κλιματική κρίση, πρέπει να καταλάβουμε τη μακρά ιστορία αλλαγής του περιβάλλοντος από τους ανθρώπους».

«Όντως, πρόσφατα έχουν επιταχυνθεί οι αλλαγές στη χρήση γης, αλλά οι άνθρωποι το κάνουν αυτό εδώ και πολύ καιρό. Τα σημερινά προβλήματα που αντιμετωπίζουμε έχουν πολύ βαθιές ρίζες και θα απαιτήσουν κάθε άλλο παρά απλές λύσεις», πρόσθεσε.

(SLpress.GR, 6 Σεπτεμβρίου 2019, https://slpress.gr/snews/o-anthropos-allazei-to-prosopo-tisgis-edo-kai-chiliades-chronia)

### Archaeological assessment reveals Earth's early transformation through land use

#### ArchaeoGLOBE Project

Environmentally transformative human use of land accelerated with the emergence of agriculture, but the extent, trajectory, and implications of these early changes are not well understood. An empirical global assessment of land use from10,000 years before the present (yr B.P.) to 1850 CE reveals a planet largely transformed by hunter-gatherers, farmers, and pastoralists by 3000 years ago, considerably earlier than the dates in the land-use reconstructions com-

![](_page_26_Picture_22.jpeg)

monly used by Earth scientists. Synthesis of knowledge contributed by more than 250 archaeologists highlighted gaps in archaeological expertise and data quality, which peaked for 2000 yr B.P. and in traditionally studied and wealthier regions. Archaeological reconstruction of global land-use history illuminates the deep roots of Earth's transformation and challenges the emerging Anthropocene paradigm that largescale anthropogenic global environmental change is mostly a recent phenomenon.

Human societies have transformed and managed landscapes for thousands of years, altering global patterns of biodiversity, ecosystem functioning, and climate (1-6). Despite increasing interest in the early global environmental changes caused by human activities, from changes in fire regimes and wild animal and plant populations by hunter-gatherers to increasingly intensive forms of agriculture, the global extent, intensity, temporal trajectory, and environmental consequences of Earth's transformation through human land use remain poorly understood outside the archaeological community (7-9). Human transformation of environments around the world began with late-Pleistocene hunting and gathering societies and increased throughout the most recent interglacial interval with the emergence of agriculture and urbanized societies. Agricultural land use is implicated in anthropogenic global environmental changes ranging from greenhouse gas emissions and climate change (5,6,10) to widespread deforestation, soil erosion, and altered fire regimes, as well as species introductions, invasions, and extinctions (4,8,11). Such changes are evident even intropical rainforests and savanna environments long considered pristine (12,13). However, existing models of long-term changes in global landuse (5,14,15) differ substantially in their representation of these early transformations (8,16), largely owing to limited incorporation of disparate empirical data from archaeology and palaeoecology (17,18). As a result, global models and assessments of early anthropogenic influence on climate, habitats, biodiversity, and other environmental changes remain poorly characterized (4,10,18,19).

Efforts to map land-cover change over thepast 10,000 years from pollen data have increased during the past decade, and high-quality regional reconstructions are now available for Europe and the Northern Hemisphere (20-24). However, global reconstructions that combine both land-use and landcover change using arange of data sources are rare (18,25)and have difficulty incorporating environmental data from archaeological sites (26). Here, we present a global assessment of archaeological expert knowledge on land use from 10,000 years before the present (yr B.P.) to 1850 CE, showing that existing global reconstructions underestimate the impact of early human land use onEarth's current ecology.

Science 365(6456):897-902 DOI: 10.1126/science.aax1192

...

https://science.sciencemag.org/content/sci/365/6456/897.full.pdf?ijkey=YEpS1UnyRzV4.&keytype=ref&siteid=sci

### ΕΝΔΙΑΦΕΡΟΝΤΑ -ΛΟΙΠΑ

#### Epic engineering rescued colossal ancient Egyptian temples from floodwaters

In 1960, a new dam on the Nile threatened Ramses II's temples at Abu Simbel and other ancient treasures. Here's how the world saved them.

![](_page_28_Picture_3.jpeg)

Photographed in 1966, faces of three of four colossal statues at the entrance to the Great Temple of Ramses II at Abu Simbel await reunion with their bodies.

Romantic poet Percy Bysshe Shelley found inspiration in the long history of Egypt when he penned "Ozymandias" around 1818. In the poem, a traveler in the desert comes across the broken ruins of a huge statue:

And on the pedestal these words appear: 'My name is Ozymandias, king of kings: Look on my works, ye Mighty, and despair!' Nothing beside remains. Round the decay Of that colossal wreck, boundless and bare The lone and level sands stretch far away.

A meditation on impermanence, Shelley's work shows how even the strongest are powerless against time and change.

![](_page_28_Picture_8.jpeg)

The Great Temple of Abu Simbel is fronted by four giant figures of Ramses II. It is difficult to tell that they were once cut into a multitude of pieces as part of the relocation effort.

Ozymandias is another name for Ramses II, the most powerful king of Egypt's 19th dynasty. Ramses' reign began a golden age in Egypt, brought on by his successful military campaigns into the Levant, Nubia, and Syria. Each of these victories was memorialized by new cities, elaborate temples, and massive statues erected all over his realm. Among his many projects were the temples of Abu Simbel in Upper Egypt. Located in Nubia along the Nile river, they were carved out of solid rock. They commemorated a victory over the Hittites at Kadesh in 1275 B.C., and reminded Nubia of Egyptian dominance. Like many ancient structures, they eventually fell into disuse, true to the themes of "Ozymandias." Sands moved in and buried the temples of Abu Simbel for millennia.

![](_page_28_Picture_12.jpeg)

Saved From the Deluge

Originally housed in the ancient fortress of Buhen in Sudan, this 13th-century B.C. relief depicts a viceroy of Ramses II before the snake goddess Renenutet. The fortress now lies under Lake Nasser. British Museum, London

In 1813, archaeologists recovered Ramses' temples from the desert, and their immortality seemed assured until 1960, when plans to dam the Nile threatened to submerge them and other ancient monuments in the region. To save them, Egypt sponsored a massive international effort to launch the most complex archaeological rescue mission of all time: to move entire sites to higher ground.

#### Before the flood

At almost 13,000 feet in length, the Aswan High Dam was to be built just south of the Nile-side city of Aswan, upstream of Luxor. The brainchild of Egypt's president, Gamal Abdel Nasser, it would prevent destructive flooding, generate power, and boost agriculture in the region.

The project, however, had major drawbacks. The creation of Lake Nasser, a 298-mile-long artificial reservoir upriver from the dam, and whose southern limits extend into Sudan, would require the resettlement of 90,000 people. The impact on the monuments that studded the Nubian region would also be catastrophic. A smaller dam, built in 1902, had already flooded some of the monuments, including the temple complex of Philae. The new project further threatened this area, as well as scores of other sites, including the Abu Simbel complex near the Egypt-Sudan border.

In 1960, the executive committee of UNESCO (the United Nations Educational, Scientific and Cultural Organization) launched its International Campaign to Save the Monuments of Nubia, appealing for the help of its member states.

Some 30 countries formed national committees—made up of researchers, archaeologists, historians, engineers, and architects—to carry out the rescue mission. Following an aerial survey that identified the location of the archaeological areas most likely to be flooded, some 20 foreign delegations launched campaigns to safeguard the monuments.

![](_page_28_Picture_22.jpeg)

![](_page_29_Figure_0.jpeg)

UNESCO organized fund-raising to rescue and preserve as many of the archaeological monuments and sites as possible. Thirty countries even issued stamps depicting the monuments as part of a fund-raising drive to cover the costs of the international campaign.

![](_page_29_Picture_2.jpeg)

Stamp issued by the Libyan government to raise funds for the endangered Nubian monuments.

The Egyptian government and UNESCO experts drew up a list of monuments threatened by the dam. A survey of just a few revealed their huge historical range spanning more than 2,000 years of human civilization. The sites included the ancient fortress of Buhen in Sudan, built by Senusret III in the 19th century B.C. It was excavated as part of the UNESCO project, and two temples were dismantled and transferred. The fortress itself, however, could not be saved and is now under water.

Other sites that were successfully transferred include: the Temple of Amada, built by <u>Thutmose III</u> in the 15th century B.C.; Wadi es-Sebua, another Ramses II–era temple of the 13th century B.C., famous for its avenue of sphinxes; and the Temple of Kalabsha, completed around the time <u>Octavian</u> declared himself the Roman Emperor Augustus in 27 B.C.

The temple complex of the island of Philae, whose decorations had been severely damaged by partial flooding caused by the earlier dam project, extends the timescale of the Nubian monuments into the Christian era. The complex was mainly built in the third century B.C., and was considered sacred to the goddess Isis. Later, a gate was erected by <u>Emperor Hadrian</u> in the second century A.D., and the temple was converted into a Church in A.D. 540 during the reign of the Byantine Emperor Justinian. Philae was eventually moved to safety on the nearby island of Agilkea.

![](_page_29_Picture_8.jpeg)

#### Safe on Dry Land

The temples salvaged on the island of Philae were reconstructed on nearby Agilkia Island. The complex was completed in 1979, a year before UNESCO formally declared the Nubian project successfully accomplished.

In addition to relocating monuments, major excavations across the whole of the Nubia region were also carried out as the dam project was completed. As a result, a vast wealth of previously unknown heritage was unearthed, ranging from Stone Age artifacts to a ninth-century church decorated with murals.

#### **Monumental mission**

The greatest challenge was saving the twin Temples of Abu Simbel, whose four colossal statues of Ramses II had become an iconic image of Egypt. The engineering feats and the expense were daunting. The team had a hard deadline, as Lake Nasser would reach full capacity in 1966.

#### A huge undertaking

![](_page_29_Picture_15.jpeg)

The illustration shows both the current and original locations of the Abu Simbel temples. The original site rests more than 200 feet below, now completely submerged by the waters of Lake Nasser.

![](_page_30_Picture_0.jpeg)

Employing special saws, a stonecutter makes a precise incision on the exterior of a temple of Abu Simbel. Blocks cut from less visible parts of the temple were made by gaspowered saws (left). Power saws are used to cut blocks of stone from the upper part of the Temple of Ramses II at Abu Simbel (right).

![](_page_30_Picture_2.jpeg)

A bulldozer scales a sand ramp in front of the Great Temple of Ramses II. The ramp provided access to the structure, as well as protection.

![](_page_30_Picture_4.jpeg)

In the lap of one of the statues of Ramses flanking the temple entrance, a group of laborers use handsaws to cut the colossus into blocks.

![](_page_30_Picture_6.jpeg)

Photographed in January 1966, laborers position the first stone of the Great Temple of Abu Simbel at its new location above Lake Nasser.

![](_page_30_Picture_8.jpeg)

Blueprints show the numbering system for the cut stone blocks, enabling them to be reassembled later.

![](_page_31_Picture_0.jpeg)

The visage of Ramses II is lowered toward the body of the statue. A concrete counterweight was attached to its back to stop any rotation during reassembly.

![](_page_31_Picture_2.jpeg)

Once the blocks are in place, laborers remove protective material that shielded the edges of the faces of the statues of Ramses II from possible damage while the blocks were being cut.

![](_page_31_Picture_4.jpeg)

Once the colossal statues of the pharaoh were in position at the new site of the Great Temple, concrete domes were constructed under which the hypogea (the temple's inner chambers) would be reassembled. The process was the same on the other temple at Abu Simbel, dedicated to Queen Nefertari. Almost 200 feet wide, the dome was designed to bear the weight of the artificial hill above it, which would emulate the cliffside setting of the original temple.

In 1963, after numerous ideas were proposed and rejected, it was decided that Ramses's temples would be cut into more than a thousand blocks and relocated to a higher spot. The mission required complex infrastructure. A temporary dam was built around the site to keep it dry. A network of supply roads had to be laid, an electricity-generating station had to be installed, and accommodations had to be provided for the thousands of laborers involved in the project.

Dismantling concluded in April 1966. Reconstruction followed, and *National Geographic* magazine documented the colossal effort of excavating the new site, moving the blocks, and putting the pieces back together. After more than two years of painstaking work, Abu Simbel was inaugurated in its new, higher location on September 22, 1968.

#### Here comes the sun king

![](_page_31_Picture_9.jpeg)

Amid all the complex logistical arrangements that ensured the safe dismantling and reassembly of the temple, as well as the artificial mound in which it is set, the engineers had to ensure that the reproduced the correct astronomical alignment so that the sun will shines directly on Ramses II twice a year deep within the sanctuary.

![](_page_32_Picture_0.jpeg)

Twice a year, sunlight enters the eastern-facing Great Temple, penetrates the Hypostyle Hall and vestibule, and reaches the inner sanctuary, where it lights up the statues of gods and Ramses II.

![](_page_32_Picture_2.jpeg)

When the sun penetrates the sanctuary of the Great Temple, its rays illuminate the faces of Ramses II and the gods Ra-Horakhty and Amon-Ra. The fourth god, Ptah who is associated with the underworld, remains in darkness.

This effort remains unequalled in the history of archaeology. The former director of the Egyptian Monuments of Nubia Service later wrote: "Thus the most imposing monument ever hewn out of rock, and the jewel of the Nubian treasures, had been saved. At the same time, the transfer of the temples fulfilled King Ramses II's dream of immortalizing his temple."

(Esther Pons / NATIONAL GEOGRAPHIC, July 17, 2019, https://www.nationalgeographic.com/archaeology-and-history/magazine/2019/07-08/egyptian-temples-excavationabu-simbel/?cmpid=org=ngp::mc=crmemail::src=ngp::cmp=editorial::add=History 20190722::rid=0000000001084349954)

#### 03 80

#### Prestressed Concrete Slab Step by Step

https://www.facebook.com/civilengineer365/videos/490201065111735/UzpfSTEw-

#### MDAwMzY3NzY4MTgzNTpWSzoxODI0NjAx-MDA3Njg10Tkz/?multi permalinks=1824647201014707%2C1824601007685993&notif id=1567695270646594&notif t=qroup activity

#### Civilengineer365

(από το μέλος της ΕΕΕΕΓΜ Γιάννη Μεταξά)

#### **(3)** 80

### The Dance of the Mississippi over the last three thousand years

![](_page_32_Picture_14.jpeg)

![](_page_32_Picture_15.jpeg)

![](_page_33_Picture_0.jpeg)

(από το μέλος της ΕΕΕΕΓΜ Γιάννη Μεταξά)

### ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

![](_page_34_Picture_1.jpeg)

#### www.isrm.net/adm/newsletter/ver html.php?id newsletter=178

Κυκλοφόρησε το Τεύχος Νο. 47 (Σεπτεμβρίου 2019) του Newsletter της International Society for Rock Mechanics and Rock Engineering με τα παρακάτω περιεχόμενα:

- <u>President's inaugural message</u>
- Farewell message of the ISRM President 2015-2019
- Election and inauguration of the new ISRM Board 2019-2023
- 27th ISRM Online Lecture by Prof. Derek Elsworth
- <u>New ISRM Fellows were inducted during the ISRM Congress 2019</u>
- Best Performing National Group Award 2017-2019 conferred to China and Korea
- <u>FedIGS Board meeting took place in Foz do Iguaçu,</u> <u>Brazil</u>
- ISRM Rocha Medal 2019 winners were selected
- Update on Eurock2020 the 2019 ISRM International
  Symposium
- International Symposium on Rock Mechanics and Engineering for Sustainable Energy, November 2019, Hanoi, Vietnam
- <u>YSRM2019&REIF2019</u>, Okinawa, Japan, 1-4 December 2019 - ISRM Specialized Conference
- <u>Arctic Expedition to Svalbard organized by the Chinese</u> <u>Society for Rock Mechanics and Engineering</u>
- ISRM Sponsored conferences

**CS 20** 

## ITA 💿 news

#### https://about.ita-aites.org/publications/archivesita/ita-news/listid-1/mailid-248-ita-news-68

Κυκλοφόρησε το τεύχος 68, Ιουλίου 2019 της ΙΤΑ με τα παρακάτω περιεχόμενα:

- MESSAGE FROM JINXIU (JENNY) YAN, ITA PRESIDENT
- ITA 45th General Assembly & WTC 2019 Video and Photos
- <u>NEW ITA PRESIDENT</u>
- 2019 GENERAL ASSEMBLY NAPLES
- Launching of Working Group 23
- Latest ITA Working Groups and Committees' publications
- ITA Tunnelling Awards: 71 valid entries collected

- <u>1st ITA-CET meeting for European tunnelling professors</u> and PhD students
- Three champions of Underground Space rock at international planning conference
- <u>Remembering Dick Robbins</u>
- Breakthrough Issue 5
- ITA-CET The Committee is pleased to present its new logo!
- <u>A productive meeting for the ITA-CET Committee in Naples</u>
- <u>Malaysia to plays host to prestigious World Tunnel Congress 2020</u>
- <u>TERRATEC joins the ITA as a Prime Sponsor</u>
- <u>AMITOS: First Photography Contest</u>
- <u>9th Nordic Grouting Symposium</u>
- <u>55th ISOCARP World Planning Congress Beyond the Me-</u> tropolis in Jakarta, Indonesia

08 80

![](_page_34_Picture_40.jpeg)

IGS NEWSLETTER – September 2019

Helping the world understand the appropriate value and use of geosynthetics

#### https://www.geosyntheticssociety.org/wp-content/uploads/2019/08/IGS-Newsletter-Sept-2019.pdf

Κυκλοφόρησε το IGS Newsletter - Σεπτεμβρίου 2019 της International Geosynthetics Society με τα παρακάτω περιεχόμενα:

- IGS Announces TC-Stabilization & TC-Hydraulics Workshops in Prague
- IGS At 3rd World Irrigation Forum
- IGS Corporate Members: Request For Video
- IGS Chapter Focus: Brazil
- Abundance Of Abstracts Received ForGeoAmericas 2020
- 7th International Conference on Earthquake Geotechnical Engineering
- Giroud Lecture Tour Success In Brazil And Chile
- Student Award Paper Spotlight: Design of a Calculation Method for Geocell-reinforced Soilsand Verification through Bearing Capacity Laboratory Experiments
- 44th meeting of CEN TC 189 "Geosynthetics", Milano, 24
  27 June 2019
- Calendar of Events
  - 3rd ICITG Guimarães, Portugal, Sept. 29 Oct. 2, 2019
  - 17th ARCSMGE Cape Town, South Africa, October 7 9, 2019
  - GAP2019 Colorado Springs, Colorado, USA|Nov. 4 7, 2019
  - TC-Stabilization & TC-Hydraulics Workshops Prague, Czech Republic, November 10 – 13, 2019
  - GeoMEast Cairo, Egypt, November 10 14, 2019

- GeoAmericas 2020, Rio de Janeiro, Brazil, April 26 29, 2020
- GEE2020, Athens, Greece, June 24 25, 2020
- 4th ICTG, Chicago, Illinois, USA, Aug. 30 Sept. 2, 2020
- EuroGeo 7, Warsaw, Poland, September 6 9, 2020
- GeoAsia 2021, Taipei, Taiwan, March 1 4, 2021

#### ΕΚΤΕΛΕΣΤΙΚΗ ΕΠΙΤΡΟΠΗ ΕΕΕΕΓΜ (2015 – 2019)

Πρόεδρος	:	Γεώργιος ΓΚΑΖΕΤΑΣ, Δρ. Πολιτικός Μηχανικός, Καθηγητής Ε.Μ.Π. <u>gazetas@central.ntua.gr</u> , <u>gazetas50@gmail.com</u>
Α΄ Αντιπρὀεδρος	:	Παναγιώτης ΒΕΤΤΑΣ, Πολιτικός Μηχανικός, ΟΜΙΛΟΣ ΤΕΧΝΙΚΩΝ ΜΕΛΕΤΩΝ Α.Ε. <u>otmate@otenet.gr</u>
Β΄ Αντιπρόεδρος	:	Μιχάλης ΠΑΧΑΚΗΣ, Πολιτικός Μηχανικός <u>mpax46@otenet.gr</u>
Γενικός Γραμματέας:		Μιχάλης ΜΠΑΡΔΑΝΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Α.Ε. <u>mbardanis@edafos.gr</u> , <u>lab@edafos.gr</u>
Ταμίας	:	Γιώργος ΝΤΟΥΛΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε ΓΕΩΤΕΧΝΙΚΕΣ ΜΕΛΕΤΕΣ Α.Ε. gdoulis@edafomichaniki.gr
Έφορος	:	Γιώργος ΜΠΕΛΟΚΑΣ, Δρ. Πολιτικός Μηχανικός, Επίκουρος Καθηγητής ΤΕΙ Αθήνας <u>gbelokas@teiath.gr</u> , <u>gbelokas@gmail.com</u>
Μἑλη	:	Ανδρέας ΑΝΑΓΝΩΣΤΟΠΟΥΛΟΣ, Δρ. Πολιτικός Μηχανικός, Ομότιμος Καθηγητής ΕΜΠ <u>aanagn@central.ntua.gr</u>
		Βάλια ΞΕΝΑΚΗ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε. <u>vxenaki@edafomichaniki.gr</u>
		Μαρίνα ΠΑΝΤΑΖΙΔΟΥ, Δρ. Πολιτικός Μηχανικός, Αναπληρώτρια Καθηγήτρια Ε.Μ.Π. <u>mpanta@central.ntua.gr</u>
Αναπληρωματικό		
Μέλος	:	Κωνσταντίνος ΙΩΑΝΝΙΔΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε. <u>kioannidis@edafomichaniki.gr</u>
Εκδότης	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε.

ΕΕΕΕΓΜ Τομέας Γεωτεχνικής ΣΧΟΛΗ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ ΕΘΝΙΚΟΥ ΜΕΤΣΟΒΙΟΥ ΠΟΛΥΤΕΧΝΕΙΟΥ Πολυτεχνειοὑπολη Ζωγρἁφου 15780 ΖΩΓΡΑΦΟΥ

Τηλ. 210.7723434 Τοτ. 210.7723428 Ηλ-Δι. <u>secretariat@hssmge.gr</u> , <u>geotech@central.ntua.gr</u> Ιστοσελίδα <u>www.hssmge.org</u> (υπό κατασκευή)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» Εκδότης: Χρήστος Τσατσανίφος, τηλ. 210.6929484, τοτ. 210.6928137, ηλ-δι. <u>ctsatsanifos@pangaea.gr</u>, <u>editor@hssmge.gr</u>, <u>info@pangaea.gr</u>

editor@hssmge.gr, ctsatsanifos@pangaea.gr

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» «αναρτώνται» και στην ιστοσελίδα <u>www.hssmge.gr</u>