TC Corner

TC306 launches an Educational Video “What happens when soil compresses”

TC306 and its Chair Prof. Marina Pantazidou are pleased to launch an educational video on “What happens when soil compresses”, and make it available through ISSMGE’s Virtual University platform. Specifically:

• The video is segmented in short-duration subsections, each with a descriptive title. Segmenting a presentation in smaller subsections (recommended 7-15 min) facilitates attendance, and the subsection titles help the audience grasp the logical structure of the webinar/course. The platform interface makes it apparent that the subsections are parts of the same course. Attendees are guided to view them sequentially, while they are free to choose their own viewing order.

• Subsections are accompanied with quizzes of multiple choice questions. Research evidence has shown that frequent quizzes result in higher learning gains than reviewing. Questions may have a single or multiple correct answers; the number of correct answers may be specified or not (for added challenge). Wrong answers can be accompanied with a short commentary. NOTE: Quizzes are visible only in the “Enroll” mode, not in the “View” mode.

• The presentation slides and transcript are available for download. The availability of the slides and transcript allow for quick and targeted reviewing of the presentation, which can become cumbersome in a watch-only mode. This feature also facilitates peer review, which will raise the standard of VU content.

• The transcript appears as text next or below the presentation slides. This feature also facilitates attendance and is particularly helpful for presenters and attendees whose native language is not English.
Research highlights

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Founded in 1832, the Saint Petersburg State University of Architecture and Civil Engineering (SPbGASU) is Russia’s oldest higher education institution for architecture and civil engineering experts. It provides a comprehensive professional education on civil engineering, architecture, transport, and environmental engineering systems. It has scored 4 stars in the QS Stars project and, according to RAEX, ranks among Russia’s TOP 100 universities.

Its structure includes 6 faculties, 41 educational and research departments, the Institute of Part-Time Studies, the Institute of Advanced Training and Professional Retraining, and 9 R&D institutes and centers. The University employs over 600 instructors, about 100 of whom have a DSc degree and 300 have a PhD; the Civil Engineering Faculty also includes 3 members, 6 corresponding members, 6 advisors, and 3 honorary members of the Russian Academy of Architecture and Construction Sciences. The student body exceeds 13,000 people, including more than 200 post-graduate students and about 1000 international students.

Rector of the Saint Petersburg State University of Architecture and Civil Engineering:

Evgeny RYBNOV, PhD in Engineering, DSc in Economics, professor, First Vice-President of the International Public Organization of Facilitation to Civil Engineering Education (ASV), Honored Worker of Higher Education of the Russian Federation, Honorary Member of the Russian Academy of Architecture and Construction Sciences, Chairman of the Organizing Committee for International Conferences on Geotechnics held at the University, sponsor of the geotechnical symposiums and exhibitions under the auspices of the Russian Society for Soil Mechanics, Geotechnics, and Foundation Engineering, the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), and the Saint Petersburg State University of Architecture and Civil Engineering. Prof. Rybnov has published over 200 research papers, including those in journals in Japan, South Korea, Germany, and other countries. Main research interests: economics; managing the construction of unique facilities in challenging engineering and geological conditions.

Committed to continuously bolstering cooperation in international academic mobility, the University joined the ERASMUS+ Learning Mobility of Individuals program in 2015. Starting from 2016, it has been engaging in student and instructor exchanges with universities from Bulgaria, Great Britain, Germany, Spain, Finland, Poland, and Lithuania, funded by ERASMUS+. The University regularly invites foreign professors and the best experts in specialized fields from other countries to give lectures, host workshops, and participate in its international conferences on geotechnics (Figures 1, 2).
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

The University is especially focused on training geotechnical engineers that specialize in civil and industrial engineering. The Department of Geotechnics (Engineering Geology, Soil Mechanics, and Foundation Engineering) has been carrying out this task with great success for over 80 years. The Department’s heads have included many prominent Russian scientists, including those with a DSc degree, such as N. A. Tsytovich, B. D. Vasilyev, N. N. Maslov, B. I. Dalmatov, and S. N. Sotnikov.

The Department of Geotechnics is primarily engaged in:

• investigating the physical and mechanical properties of soils at the base of buildings and structures;
• improving the construction of foundations, including pile foundations, on soft, highly compressible soils;
• analyzing the progression of base deformations under the foundations of various structures;
• investigating the properties of frozen, freezing, and thawing soils, and using such soils as structure bases;
• investigating the dynamic properties of soils and developing a methodology for assessing base deformations under dynamic impact;
• carrying out numerical calculations and contrasting them against the results of observations and studies in the field
• improving the methods of base and foundation reinforcement during building reconstruction.

The employees of the Department of Geotechnics (N. N. Morareskul, S. N. Sotnikov, V. N. Bronin, R. A. Mangushev, B. I. Dalmatov, V. D. Karlov, I. I. Sakharov, A. I. Osokin, R. A. Usmanov, A. V. Golli, A. A. Ananyev, V. V. Konyushkov, A. Zh. Zhussupbekov and others) have contributed to creating multiple technical standards and written monographs, textbooks, and manuals on the mechanics of soils, bases, and foundations.

Under the guidance of A. B. Fadeyev, Honored Worker of Science and professor at the Department, with the help of his followers, the Department’s researchers began to widely use numerical methods for analyzing the interaction of base soils with structures (based on the modern achievements of nonlinear soil mechanics and the finite element method), in addition to studying the impact of undermining on the deformation of existing buildings and structures.

At the Faculty of Civil Engineering, 14 members are involved in research covering a broad range of geotechnical areas.

Professor Rashid Mangushev
Starting from 2001, the Department of Geotechnics has been headed by Rashid Mangushev, corresponding member of the Russian Academy of Architecture and Construction Sciences, Vice-President of the Russian Society for Soil Mechanics, Geotechnics, and Foundation Engineering, PhD in Engineering.

Professor R. Mangushev is also the director of the Geotechnology Center and the Soil Testing Center at the Saint Petersburg State University of Architecture and Civil Engineering. He received the “For Merit to the Fatherland” medal; the Order “Star of Glory. Economy of Azerbaijan”; the Construction Glory badge of honor, awarded by the Russian Union of Builders; two silver medals and two diplomas, awarded by the Russian Academy of Architecture and Construction Sciences; and honorary medals, awarded by the Russian Society for Soil Mechanics, Geotechnics, and Foundation Engineering.

Professor Mangushev heads a research school titled “Construction Technology and Management, Bases and Foundations, Underground Structures”. He is the author and co-author of more than 300 published studies, including 9 monographs, and owns 12 invention and patent certificates; he has written 5 textbooks on soil mechanics and bases and foundations, as well as 3 Russian reference books, 3 geotechnical glossaries, and 10 federal manuals.
Professor Mangushev has overseen the successful organization of 16 Russian and international conferences on geotechnics, supported by the Russian Academy of Architecture and Construction Sciences, the Russian Society for Soil Mechanics, Geotechnics, and Foundation Engineering, and the ISSMGE (Figs. 3, 4, 5). He is often invited to give lectures and presentations at Russian and foreign higher education institutions (in Belarus, Germany, Great Britain, Poland, China, Finland, Sweden, Korea, Japan, Kazakhstan, Taiwan, Mongolia, and the USA). He is the scientific editor of the Geotechnics section of the Bulletin of Civil Engineers, a member of the editorial boards of 4 geotechnical journals, and editor of the international collection of research papers, titled “Fundamentals and Applications in Construction: New Materials, Structures, Technologies and Calculations” (CRC Press, 2019). Professor Mangushev has provided research support for many major design and construction projects in Saint Petersburg and other regions of Russia, including the 2nd venue of the State Academic Mariinsky Theater, the reconstruction of the Bolshoi Drama Theater, and the Lakhta-2 multifunctional complex.

Figure 3. Group photo from the ceremony in honor of Professor Yoshinori Iwasaki (Japan) as he receives the Honorary Doctor title at the Saint Petersburg State University of Architecture and Civil Engineering

Figure 4. Dr. Tomas Bauer, President of the Bauer construction company (Germany), guest lecturer at the University

Figure 5. Group photos of the delegates at the 2nd Russian-American Geotechnical Symposium (May 17 and 18, 2018), hosted at the Saint Petersburg State University of Architecture and Civil Engineering in Saint Petersburg, Russia
1.1.1

Professor Vladimir Lushnikov

Current research:
Analysis and recommendations for stabilizing the tilt of the Leaning Tower of Nevyansk, the Russian counterpart of the Leaning Tower of Pisa, Italy

The Leaning Tower of Nevyansk is a famous landmark in the Ural Region. It was built by merchant Demidov in the 18th century. The tower is 57 m tall. Geodetic measurements showed that the top of the tower is tilted by 2.2 m along the horizontal axis, and the total tilt angle reaches 2.9°. The tower continues moving by an estimated 0.5 to 0.9 mm per year on average. Further geodetic studies proved that the tilt is increasing, albeit very slowly. The main reason behind the tilt is the filled soil (slag) and soft soil (brought in by the Neyva River) at the base.

Figure 6. Comparison between the changes in the tilt of the Leaning Towers of Pisa and Nevyansk

Today, the tower’s safety factor is within acceptable limits. But, according to some assessments, it may buckle within 100 years or more. Figure 7 shows some suggestions for stabilizing the tower. The stabilization methods include, first and foremost, mortar grouting of the base soils or installation of bored piles under the foundation (Fig. 7).

Figure 7. Methods of stabilizing the Leaning Tower of Nevyansk
a-soil injection, b,c - bored piles, d - counterweights
Current research:
1. Research and technical support for designing a mining and processing facility near a gold deposit in the Magadan Region. Below is an example of assessing the temperature field under a large-scale building, designed with permafrost thawing in mind (Figs. 8, 9).

The research shows that the configuration of the thawing zone differs significantly from the traditional layout, where maximum thawing always occurs underneath the central point of the heated facility. The reason is that the soils under the building all have different thermal conductivity levels.

2. Extending a runway at the Yakutsk airport, Russia. Below is an example of assessing the temperature field under a runway, with solar radiation (Fig. 10)
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Professor Askar Zhussupbekov

Research interests:
Professor Zhussupbekov is engaged in geotechnical engineering (piles and deep foundations), geomonitoring, undermining, disaster prevention and mitigation, in situ testing. He carries out theoretical and experimental research, as well as consulting work for civil and geotechnical projects in Nur-Sultan (Kazakhstan), Saint Petersburg, Moscow, Yuzhno-Sakhalinsk (Russia), and the Caspian Sea Area (offshore and onshore structures).

Professor Zhussupbekov is a scientific consultant on issues related to pile foundations for such projects as the Second Generation Plant at the Tengiz field (Caspian Sea coast) and Karabatan, Kashagan (Atyrau), where the clients are PFD (USA) and AGIP (Italy); the International Airport Projects, where the clients are Asian Pacific (Japan) and Alsim Alarko (Turkey); buildings for the US Embassy, where the client is Fluor Caspian Services, Ltd. (USA); and other mega projects related to challenging soils of Russia and Kazakhstan such as EXPO, Abu-Dhabi Plaza, Khan-Shatyr, and Astana-LRT (Nur-Sultan), Mariinsky Theater, building of Synagogue (Saint Petersburg, Russia), structures in Nevelsk city (Far East Russia).

Current research topics
1. ADP mega project (pile testing, geomonitoring). In collaboration with: Professor Mangushev, Saint Petersburg State University of Architecture and Civil Engineering, Saint Petersburg, Russia

High-rise buildings (more than 75 m tall) pose new challenges for engineers, especially in the field of calculations and design of above-ground structures, as well as bases and foundations. Therefore, designers of both above-ground and underground parts of such buildings are forced to resort to more complex methods of calculation and design. This applies to geotechnical engineers who are involved in the design of foundations for high-rise buildings. In terms of complexity, challenging design, erection, operation, and impact on the environment and people, high-rises can be classified as structures of increased danger and complexity.

The ADP (Abu-Dhabi Plaza) project is a new development of 5 hectares, comprising retail, office, residential, and hotel buildings. The development incorporates the tallest tower in Central Asia (310 m tall). It is designed to be a symbolic and commercially important component of the master plan and intended for a new business center in Nur-Sultan. Its architectural concept is shown in Figure 11, which represents the construction site with the skyscraper in the center.

Figure 11. Abu-Dhabi Plaza and an ADP Block R model (75-story, 310 m tall)
Before foundation laying, the corresponding technology and foundation depth shall be chosen depending on the expected load and natural conditions, including the type of soil and the groundwater level. The ADP residential skyscraper consists of 5 main towers (Fig. 11).

**Abu Dhabi Plaza Foundations:** 1125 auger cast piles; 1.2 to 1.5 m in diameter; 13 to 25 m in length; 40 MPa Concrete with durability against severe exposure.

2. Expo mega project, Kazakhstan (pile testing, geomonitoring)

The Kazakhstan Pavilion is the only building in the world, which is a sphere of the finished form with a diameter of 80 m (Fig. 12). Possessing the unique design features set by the building form, and also the functions of the exhibition building, it serves as a striking example of application of renewable energy. The site chosen to accommodate Expo-2017 Astana is located 8 km south of the Old City of Nur-Sultan and just 4 km from the new government block on the southern bank of the Ishim River. The exhibition area of 25 hectares is surrounded by a territory of 149 hectares, intended for housing residential and mixed-use buildings, auxiliary exhibition facilities, and transport infrastructure. The total exhibition area is 174 hectares.

The methodology for determining the piles’ bearing capacity was briefly given. Bored piles 31.5 m long and 1000 mm in diameter were tested. Vertical static load tests were carried out for the following load configurations: bi-directional static load tests in accordance with ASTM D8169, static compression load tests in accordance with ASTM D1143-07, and static load tests in accordance with GOST 5686-94. The results of testing the piles with such methods as vertical static compression load test by ASTM (SCLT), static load test by GOST (SLT) and bi-directional static load test by ASTM D8169 (BDSLST) are presented below (Figs. 13, 14).

![Figure 12. Expo mega project, Kazakhstan Pavilion (sphere)](image1)

![Figure 13. Static compression load test and bi-directional static load test (O-cell) at the Expo construction site](image2)
Figure 14. Comparison of the test results (SCLT, SLT and O-Cell methods)

Figure 14 shows a comparison of the test results in the form of a curve obtained by the SCLT method and equivalent “load/settlement” curve obtained by the O-Cell method.

Associate Professor Anatoly Osokin

Research interests: difficult cases in geotechnical practice; identification and elimination of geotechnical construction risks to ensure occupational safety; methods of stabilizing soft soils: jet grouting, deep mixing, CSM, TAM technology, vibroflotation; all types of pile foundations in soft soils; pile foundations and barrettes of high-rise buildings and bridges; deep foundations; methods of strengthening the bases and foundations of restored buildings; installation of underground structures in soft soils in historical urban development areas; stability issues related to high embankments on soft soils.

Current research and achievements in applied geotechnics:
1. Preserving the architectural and cultural heritage of Saint Petersburg

Developing recommendations, supporting design projects as a research consultant, providing methodological tools for geotechnical monitoring, providing research and technical support for adapting the courtyard wing of the Shuvalov Palace on the Fontanka Embankment, 21 for modern use, including the basement floor in challenging soil conditions (Fig. 15).

Figure 15. Panorama of the Naryshkin-Shuvalov Palace on the Fontanka Embankment (a) and the basement floor of the courtyard wing that is undergoing restoration (b)
2. Foundation construction for high-rise buildings; deep pits
Providing research consultations and geotechnical support at the design and construction stages (installation of test piles), as well as during digging a pit (over 19.0 m deep) at the construction site of the Lakhta Center business complex in Saint Petersburg, and pit sheeting (Figs. 16, 17, 18).

*Figure 16. Research and technical support during the pile test for the Lakhta Center high-rise segment: a) test pile installation at 74 and 84 meters underground (pile diameter: 2000 mm); b) mathematical assessments of a long pile’s (up to 100 m) bearing capacity under the pile toe and along the side surface; c) equipment used for testing piles; d) Osterberg Cells® integrated into the reinforcement cage.*

*Figure 17. Geotechnical support for installing a “slurry wall” structure, 1200 mm thick and 35 m long: a) assessment of the borehole’s wall stability; b) a view of the construction site during the “slurry wall” installation.*

*Figure 18. A view of the completed pit for the high-rise segment of the Lakhta Center business complex.*
3. Examination of piles’ load-bearing capacity through time for reconstruction purposes
This long-term study was aimed at accounting for the change in piles’ load-bearing capacity through time, which tends to occur in soft soil environments. The study has made it possible to refine the design parameters of pile foundations during building reconstruction (Figs. 19, 20). The study has led to mastering the methods of testing piles within the structure with their action being accounted for.

Figure 19. Diagram illustrating the dependency between the pile settlement level and the load on the pile, based on the static test of the pile at a residential building construction site in Tosno, Leningrad Region: 1 – a test 74 days after piling; 2 – a test 203 days after piling; 3 – a test 2.8 years after piling

Figure 20. a) Results of inspecting and testing piles within the on-site foundation frame, b) testing the capacity of a pile at the construction site of a multifunctional center on Ligovsky Prospekt for bearing a load of 15,000 kN
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Associate Professor Vladimir Konyushkov

Associate Professor at the Department of Geotechnics of the Saint Petersburg State University of Architecture and Civil Engineering

Main research interests:
- designing pile foundations,
- assessing the impact of digging pits for new construction sites on the existing urban development,
- determining slope angles through different methods.

Current research:
Comparing results of modeling slope stability in the Plaxis software, the results of analytical calculations with a simplified method, and the results of field studies (Figs. 21, 22, 23, 24).

Figure 21. Vector representation of filtration water movement in a sandy slope

Figure 22. Isolines of water’s hydrodynamic pressure during filtration through a sandy slope

Figure 23. Analytical diagram of a slope with the step-by-step process of determining the sliding triangle

Figure 24. Analytical diagram of a slope, including: the self-weight of the soil triangle, water’s hydrodynamic pressure, load along the edge through time, and seismic impact during an earthquake
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Associate Professor Sergei Lanko

Research and professional interests
• testing permafrost soils,
• designing foundations for permafrost environments,
• additive manufacturing and its use in geotechnics.

He has experience in designing the foundations of technological equipment, including those in challenging soil conditions (collapsing and swelling soils, seismic activity around the construction sites). He has contributed to Russian and international conferences.

Current research:
Comparing the numerical clay soil freezing models with field data.

The project involves freezing clay soils in special equipment under preset physical and thermal conditions and then studying the nature of the freeze, the formation of the cryotexture, and changes in temperature depending on the sample depth.

Using Frost 3D, which allows for creating three-dimensional numerical models of the freezing/thawing processes in the soil, researchers simulate the freezing of different soil samples simultaneously and assess the nature of temperature changes and freezing depth.

Figure 25. An example of a numerical clay soil freezing model
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Associate Professor Ivan Dyakonov

Current research subjects
1. Studying deep foundations of unique buildings
Dr. Dyakonov has carried out numerical analyses of high-rise buildings and unique structures in Russia and abroad. These include the analyses of foundations for the following structures: the Lakhta Center building complex (Fig. 27); a high-rise building in Minsk, the Republic of Belarus (Fig. 28); a mining and processing plant servicing the Magadan gold ore deposit; a mining and processing plant servicing the Udokan copper deposit; airfield pavement at the Grozny airport, etc.

Figure 26. A general overview of the Lakhta Center building complex (462 m tall) in Saint Petersburg and calculations for the second phase of construction

Figure 27. A general overview of a design project for a high-rise building (189 m tall) in Minsk, the Republic of Belarus, and an analytical model of the building’s structure
2. Load-bearing capacity of a cast-in-situ pile with a sacrificial drill bit, accounting for the methods of manufacturing such piles

Determining the reasons for cast-in-situ pile defects, depending on soil and material type, in environments with soft thixotropic soils. The study includes three sections: pile installation technique, construction materials, and geotechnics.

- The analysis of technological equipment and processes determines the design layout, which accounts for the stage-by-stage changes in the stress-strain state (SSS) (Fig. 29).
- X-ray phase analysis and laboratory tests of how concrete responds to thixotropic soils have made it possible to identify the reasons for the drop in concrete strength and defect formation (Fig. 28).
- The study’s geotechnical section includes the design of a preliminary analytical and numerical model for changes in the soil’s SSS.

The expanding cylinder analytical model has made it possible to highlight the drawbacks of the equipment for Fundex type piles and provide theoretical data to back up the claims about the load-bearing capacity of the soil along the side surface of such piles.

**Figure 28. Types of defects occurring in cast-in-situ piles with a sacrificial drill bit**

**Figure 29. A model suggested for tracking the sequence of changes in the soil’s stress-strain state**
Associate Professor Maxim Paramonov

Research interests:
development of frozen soil mechanics, construction of underground structures in challenging geological conditions, frost heaving and thawing of soils, models of soil behavior under thermal impact.

Current research
1. Research and technical support for a construction site: Mining and processing plant servicing the Pavlik gold ore deposit (Magadan Region, Tenkinsky District). Expansion of up to 10 million tons per year (Fig. 30).

Figure 30. Structure model on actual terrain

2. Research and technical support for construction sites: a control tower at the Tyumen airport, a control tower at the Petrozavodsck (Besovets) airport (Figs. 31, 32).

Figure 31. 3D model of the control tower in Tyumen (Russia)
Figure 32. 3D model of the control tower in Besovets (Russia)
Assistant Professor Filipp Kalach

Research interests:
• studying the methods of grouting the foundation bases of buildings during reconstruction with the use of the latest grouting materials that will improve the strength and stress-strain behavior of soft soils;
• developing a methodology for determining the key grout parameters and applying these parameters to the creation of an analytical model for assessing the physical and mechanical properties of the strengthened soil mass for the purpose of analyzing additional building settlements;
• discovering how the grout spreads through the soft soil and experimenting with the changes in the properties of the soil mass after the introduction of solidifying grout;
• developing a methodology for assessing artificial bases that form after the introduction of new grout types.

Main current studies:
1) Laboratory tests of how double-component grout with a polymer binder penetrates water-saturated silty sands (Fig. 34-a).
2) Physical and mathematical simulation of a grouted zone during building reconstruction (Fig. 33-b).

Centers and programs involving faculty members:
1. Scientific & Consulting Geotechnology Center (SCGC), Department of Geotechnics, Saint Petersburg State University of Architecture and Civil Engineering

Directed by Professor Rashid Mangushev, (SPbGASU)
Geotechnology Center for foundation engineering is engaged in the creation and dissemination of knowledge and development of design, testing, and advising resources for practical application in the areas of geotechnical engineering, as well as development of innovative ideas related to soil/structure interaction issues on soft soils in Saint Petersburg.
Research highlights (Con’t)

Geotechnical Engineering Research of the Saint Petersburg State University of Architecture and Civil Engineering

Main activity:
- Engineering, geological, and hydrogeological investigation of soft soils and foundation bases.
- Project development and construction of foundations, pits, and drainage systems.
- Reconstruction and reinforcement of weak bases and foundations, adjustment of the existing projects to the conditions of the construction site.
- Conclusions regarding the technical condition of buildings and drainage systems.
- Analysis of the results of scientific investigations, projects, evaluation of the quality and volume of the completed works.
- Scientific investigations and developments in geotechnics and geotechnology (Fig. 40).
- Consultations and analysis related to the construction of piles, deep foundations, and underground structures.

Figure 40. Consulting, scientific support, and monitoring related to underground facilities, rendered by the SCGC in Saint Petersburg

2. Soil Testing Center, Saint Petersburg State University of Architecture and Civil Engineering

The Center is operated by the Department of Geotechnics of the Saint Petersburg State University of Architecture and Civil Engineering. It possesses the latest test equipment and has all the necessary state licenses and certificates.

Directed by Professor Rashid Mangushev, (SPbGASU)
The Soil Testing Center has state-of-the-art geotechnical tools for laboratory and field soil tests, manufactured by Russian and foreign companies.
In its work, the Center uses:

- a stabilometer with a three-ton force for testing soils under a pressure of up to 8 MPa (Fig. 41),
- a geotech portable cone penetration test unit, made in Sweden, with a pore pressure measurement feature
- a 27 m$^3$ freezer for testing frozen and freezing soils (Fig. 42),
- other unique geotechnical test equipment.

Key specialization areas:

- Testing dispersive soils to determine their physical properties
- Testing dispersive soils to determine their mechanical properties
- Testing rocky and reinforced soils to determine their physical and mechanical properties
- Using special programs for complex soil tests
- Adapting the test results to different analytical models
- Improving test methods, techniques, and tools
- Applying BIM to geotechnics

The Center carries out laboratory tests of soils in sub-zero temperatures, during freezing and thawing of samples. This is especially relevant to exploring the Far North, the Arctic, and the Russian North-West. The results of soil testing are used for providing geotechnical rationale and research support for the construction of structures in challenging engineering and geological conditions.
In order to continue the scheme of “Geotechnique for sustainable development and emerging market” raise in the 16th Asian Regional Conference (16ARC) held in Taipei, Taiwan (Fig. 1) in October 2019 and promote recent developments of geotechnical technologies, Chinese Taipei (Taiwan) Geotechnical Society (CTGS) organize a series of webinar (CTGS webinar), starting from 26th of January until 25th of March 2021.

CTGS webinar has 8 sessions including “On the spatial landslide hazard with the consideration of climate change”, “Soil dynamics and earthquake engineering”, “Deep excavation (I)”, “Deep excavation (II)”, “Soil reinforcement and ground improvement”, “Geophysics”, “Pile foundation” and “Tunneling and engineering geology”. Each session starts from 0730pm Taipei time (GMT + 8) and lasts for an hour. In addition to Sessions No. 1 and 8, it has 3 to 4 presentations for each session and it takes 15-min long for every presentation. The session also has 15-min Q and A so the audiences can raise questions and comments and presenters are therefore able to respond. It has one presentation in Session No. 1 and 2 presentations in Session No. 8 but the total time for both sessions remain one hour each.

Members from CTGS are assigned to be the session leader/chair and presenters of the webinar even come from different member societies in Asia region of International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE). Among these sessions, “Deep excavation (I)” and “Deep excavation (II)” are jointly organized by Asian Technical Committee 6 (ATC6) “Urban GeoEngineering” of ISSMGE.

Moreover, several comparatively well-known personnel are invited to give CTGS webinar keynote lectures to share their valuable experience in geotechnical engineering during the same period.

Session No. 1 was given by Prof. Keh-Jian Shou, immediate past president of CTGS and the candidate of vice president election of Asian region of ISSMGE nominated by CTGS on 26th of January 2021. In Professor Shou’s talk, it aims to explore the impact from climate change on rainfall frequency and landslide hazards (Fig. 2). The atmospheric general circulation model (AGCM) downscaling estimation are used to understand the temporal rainfall trends, distributions, and intensities in the study area in Taiwan. Among the others, logistic regression methods and supporting vector machines method (SVM) are applied to obtain the spatial landslide susceptibility distributions. Based on the predicted rainfall, the results of landslide susceptibility analysis can be applied for risk prevention and management in the study area. At the day, 80 plus audiences from various locations in the world, such as Taiwan, Japan, China, Hong Kong, Malaysia, Indonesia, Thailand, Sri Lanka, Nepal, Kazakhstan and even the United Kingdom registered and attended the lecture.
The program is expected to be run up to the end of March 2021 and details of each session will be shortly announced in the part of “International News” of the web site of CTGS which is www.tgs.org.tw and please feel free to contact secretary of CTGS by testw999@gmail.com if any inquiry for CTGS webinar in 2021. Through organizing this webinar, CTGS intends to provide a platform which each member society can exchange different view and ideas in various aspects of geotechnical engineering so please do circulate the information of 2021 CTGS webinar and welcome everyone to participate.

(a) Various landslides in Taiwan

(b) Predicted landslides hazards using SVM based on data from Typhoon Mindulle in 2004

Figure 3. Some details of the presentation delivered by Prof. Keh-Jian Shou
Message from member society (Con’t)

Chinese Taipei (Taiwan) Geotechnical Society Webinar, 2021

**TGS**

**Chinese Taipei Geotechnical Society Webinar**

**INTRODUCTION:**

In order to promote some geotechnical technologies and researches developed, a series of lectures will be delivered between January to March 2021 through webinar, organized by Chinese Taipei Geotechnical Society (CTGS).

**CONTENT OF WEBINAR:**

<table>
<thead>
<tr>
<th>Topic of Session</th>
<th>Date</th>
<th>Time</th>
<th>Session Leader</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake slide landslides based with the Consideration of Climate Change</td>
<td>26th of January 2021 (Tuesday)</td>
<td>01:00pm to 03:30pm</td>
<td>Professor K. J. Shou, National Chung Hsin University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Soil mechanics and earthquake engineering</td>
<td>25th of February 2021 (Thursday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor Louis Ge, National Taiwan University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Deep excavation (I)</td>
<td>8th of March 2021 (Thursday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor Benson Hlung, National Kaohsiung University of Science and Technology, Taiwan</td>
<td>Jointly organized with ISSMGE ATCS “Urban Geotechnics”</td>
</tr>
<tr>
<td>Deep excavation (II)</td>
<td>11th of March 2021 (Thursday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor Benson Hlung, National Kaohsiung University of Science and Technology, Taiwan</td>
<td>Jointly organized with ISSMGE ATCS “Urban Geotechnics”</td>
</tr>
<tr>
<td>Soil reinforcement and ground improvement</td>
<td>15th of March 2021 (Monday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor K. M. Yang, National Taiwan University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Geophysics</td>
<td>15th of March 2021 (Monday)</td>
<td>08:30pm to 09:30pm</td>
<td>Professor C. P. Kuo, Mingzhu University of Science and Technology, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Pile foundation</td>
<td>23rd of March 2021 (Tuesday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor D. W. Chang, Taikang University, Taiwan</td>
<td></td>
</tr>
<tr>
<td>Foundation engineering</td>
<td>25th of March 2021 (Thursday)</td>
<td>07:30pm to 09:00pm</td>
<td>Professor T. T. Wang, National Taiwan University, Taiwan</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

1. It is Taipei time zone which is GMT +8
2. Details of presentation topics and presenters will be announced at least a week before the lecture. Please refer to "International Message" which is announced via the CTGS website (www.tgs.org.tw).

**REGISTRATION AND ACCESS OF WEBINAR:**

Please refer to details in "International Message" of CTGS website (www.tgs.org.tw).

**INQUIRY OF WEBINAR:**

For any inquiry of the webinar, please contact tgstw999@gmail.com

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**CHINESE TAIPEI (TAIWAN) GEOTECHNICAL SOCIETY (CTGS) WEBINAR KEYNOTE LECTURE**

Date/Time: 18th of February (Thursday), starting from 07:30pm, Taipei time (GMT +8)

Session Leader/Chair: Professor Keh-Jian Shou, National Chung Hsin University, Taiwan

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic of the presentation</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>07:30-07:40 pm</td>
<td>Opening remarks</td>
<td>Professor Keh-Jian Shou, National Chung Hsin University, Taiwan</td>
</tr>
<tr>
<td>07:40-08:25 pm</td>
<td>Geotechnical Problems of Megastructures in Kazakhstan</td>
<td>Professor Askar Zhussupbekov, Past Vice President of the International Society of Soil Mechanics and Geotechnical Engineering in Asia</td>
</tr>
<tr>
<td>08:25-08:40 pm</td>
<td>Q and A</td>
<td>Professor Keh-Jian Shou, National Chung Hsin University, Taiwan</td>
</tr>
</tbody>
</table>

Registration Link: https://forms.gle/E1TfyyKbFQ26CGY8A

Registration for the keynote lecture starts from today and end on February 16, 2021.

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Figure 4. Overall program of CTGS webinar in 2021

Figure 5. CTGS webinar keynote lecture delivered by Professor Askar Zhussupbekov, Past Vice President of ISSMGE in Asia
Chinese Taipei (Taiwan) Geotechnical Society Webinar, 2021

**Figure 6. Presentations of CTGS Session No. 2 webinar - Soil dynamics and earthquake engineering**

- **Date/Time:** 25<sup>th</sup> of February (Thursday), starting from 0730pm, Taipei time (GMT+8)
- **Session Leader/Chair:** Professor Louis Ge, National Taiwan University, Taiwan

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic of the presentation</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0730-</td>
<td>Opening remarks</td>
<td>Professor Louis Ge, National Taiwan University, Taiwan</td>
</tr>
<tr>
<td>0735-</td>
<td>Site Response Analysis - From Horizontal Motion to Vertical Motion</td>
<td>Professor Chi-Chin Tsai, National Chung Hsin University, Taiwan</td>
</tr>
<tr>
<td>0750-</td>
<td>A Plasticity Model for Liquefaction Simulation Considering Binary</td>
<td>Dr. Fu-Hsuan Yeh, National Taiwan University, Taiwan</td>
</tr>
<tr>
<td>0805-</td>
<td>Use of PDC for Liquefaction Potential Evaluations in Taiwan</td>
<td>Professor Louis Ge, National Taiwan University, Taiwan</td>
</tr>
<tr>
<td>0820-</td>
<td>Q and A</td>
<td>Professor Louis Ge, National Taiwan University, Taiwan</td>
</tr>
<tr>
<td>0840 pm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Registration Link:** [https://forms.gle/24Fp1XhShFFnXUA](https://forms.gle/24Fp1XhShFFnXUA)

**Figure 7. Presentations of CTGS Session No. 3/ATC6 joint webinar - Deep excavation (I)**

- **Date/Time:** 4<sup>th</sup> of March (Thursday), starting from 0730pm, Taipei time (GMT+8)
- **Session Leader/Chair:** Professor Benson Hsiung, Chair of International Affair Committee of CTGS, Taiwan and Secretary of ATC6

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic of the presentation</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0730-</td>
<td>Opening remarks</td>
<td>Professor Benson Hsiung, CTGS, Taiwan and ATC6</td>
</tr>
<tr>
<td>0740-</td>
<td>Observation of deep excavations in sand and interpretation of plane</td>
<td>Professor Benson Hsiung, CTGS, Taiwan and ATC6</td>
</tr>
<tr>
<td>0755-</td>
<td>The application of automation and BIM assistant design of</td>
<td>Mr. Chien-Ming Lai, SINOTECH Engineering Consultants, Ltd., Taiwan</td>
</tr>
<tr>
<td>0810-</td>
<td>Mr. Yuan-Yao Tsai and Mr. Shang-Ping Sung, CECI Engineering</td>
<td>Mr. Yuan-Yao Tsai and Mr. Shang-Ping Sung, CECI Engineering Consultants, Inc., Taiwan</td>
</tr>
<tr>
<td>0825-</td>
<td>Challenges of the Record Deepest Excavation Design for Taichung</td>
<td>Mr. Yuan-Yao Tsai and Mr. Shang-Ping Sung, CECI Engineering Consultants, Inc., Taiwan</td>
</tr>
<tr>
<td>0840 pm</td>
<td>Q and A</td>
<td>Professor Benson Hsiung, CTGS, Taiwan and ATC6</td>
</tr>
</tbody>
</table>

**Registration Link:** [https://forms.gle/LDysiu9HtSvbrd96](https://forms.gle/LDysiu9HtSvbrd96)

**Registration for the first session starts from today and end on February 23, 2021.**

**Registration for the first session starts from today and end on March 2, 2021.**
Message from member society (Con’t)
Chinese Taipei (Taiwan) Geotechnical Society Webinar, 2021


- **Date/Time:** 11th of March (Thursday), starting from 0730pm, Taipei time (GMT+8)
- **Session Leader/Chair:** Professor Benson Hsiung, Chair of International Affair Committee of CTGS, Taiwan and Secretary of ATC6

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic of the presentation</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0730-0740 pm</td>
<td>Opening remarks</td>
<td>Professor Benson Hsiung, CTGS, Taiwan and ATC6</td>
</tr>
<tr>
<td>0740-0755 pm</td>
<td>FEM modeling of a deep excavation in under consolidating clay: a case history</td>
<td>Dr. Aswin Lim, Universitas Katolik Parahyangan, Indonesia</td>
</tr>
<tr>
<td>0755-0810 pm</td>
<td>Performance of Deep Excavation in Limestone Formation Adjacent to Railways Protection Zone</td>
<td>Ir. Chow Chee Ming, G &amp; F Consultant, Malaysia</td>
</tr>
<tr>
<td>0810-0825 pm</td>
<td>Geotechnical Challenges in Deep Tunnel Sewerage System in Singapore</td>
<td>Er. Pang Piong Yang, Arup Singapore Pte. Ltd, Singapore</td>
</tr>
<tr>
<td>0825-0840 pm</td>
<td>Q and A</td>
<td>Professor Benson Hsiung, CTGS, Taiwan and ATC6</td>
</tr>
</tbody>
</table>

Registration Link: https://forms.gle/ReaXXysYxy78cwp9
Registration for the first session starts from today and end on March 2, 2021.

Figure 8. Presentations of CTGS Session No. 4/ATC6 joint webinar - Deep excavation (II)

Professor Bin-Chen Benson Hsiung
CTGS (Taiwan)
The 4th European Conference on Unsaturated Soils, E-UNSAT 2020—Unsaturated Horizons, was organised by Prof. Rafaela Cardoso from Instituto Superior Técnico IST in Lisbon, in collaboration with Cristina Jommi from Technische Universiteit Delft TU Delft in Delft and Enrique Romero from Universitat Politècnica de Catalunya UPC in Barcelona. The conference series is supported by the Technical Committee TC106 of the International Society of Soil Mechanics and Geotechnical Engineering on ‘Unsaturated Soils’, and E-UNSAT 2020 followed the previous successful ones in Durham (2008), Napoli (2012) and Paris (2016).

To face the worldwide pandemic, E-UNSAT 2020 had to be adjusted to a fully online conference, after being postponed from June to October 19-21, 2020. This is the first online conference of this series, and indeed one of the first events of the ISSMGE, which had to find novel organisation strategy during the pandemic. Although we hope to return soon to on-site conferences, where people can freely meet and exchange ideas, the online format gave the opportunity to extend the accessibility of the conference to a broader transcontinental audience.

The online event counted with 202 participants (159 delegates and 43 webinar attendants) from 40 countries, among which 18 were European countries. The conference format replicated the previous ones, including special plenary sessions and parallel sessions. Care was taken on scheduling the sessions taking into consideration the different time zones of the presenting authors, as well as the availability of the chairs of each session.

After the welcome address of Prof. Rafaela Cardoso, the conference started with the TC106 - 2nd European Distinguished Lecturer on Unsaturated Soils, Prof. Enrique Romero, UPC Barcelona, who gave an extensive and inspiring talk on ‘New research topics in experimental unsaturated soil mechanics. Hydro-mechanical behaviour of compacted vegetated soils’ (Fig. 1). The session was chaired by Prof. David Toll, Chair of the TC106.
Two exciting Keynote Lectures were given during the conference on ‘Bentonite clay barriers in nuclear waste repositories’ by Prof. Lyesse Laloui, from EPFL Lausanne (Fig. 2, left), and ‘A sustainable and bioengineered three-layer unsaturated landfill cover system without a geomembrane’ by the president of the ISSMGE, Prof. Charles Ng (Fig. 2 left), from HKUST Hong Kong.

Following a recently established ‘tradition’ over the conferences organised by TC106, a plenary session was dedicated to Young Invited Lecturers (Fig. 3), who presented their view on the use of the Material Point Method in unsaturated soil mechanics. ‘Granular Material Point Method or how to model rapid flows of unsaturated granular materials’ was the talk given by Prof. Wojciech Solowski, from Aalto University Finland, and Dr. Alba Yerro, from Virginia Tech USA, tackled ‘Unsaturated soils and large deformations with the Material Point Method’. The session was chaired by Prof. Eduardo Alonso, UPC Barcelona, who led the following discussion.
Conference reports (Con’t)

The 4th European Conference on Unsaturated Soils, 19-21 October, 2020 (online)

Two more plenary sessions were organised as Panel Sessions, on still ‘controversial’ topics related to unsaturated soil mechanics. On the second day, a discussion on the implementation of unsaturated soil mechanics in codes of practice was chaired by Prof. Simon Wheeler, from University of Glasgow UK, after three invited contributions (Fig. 4). The talks were given by Prof. Marcos Arroyo, UPC Barcelona, introducing ‘Unsaturated soils and Eurocodes’, Prof. Adrian Russell, UNSW Australia, presenting ‘The use of unsaturated soil mechanics in engineering practice: Codes and current trends in Australia’ and Prof. Cristina Jommi, TU Delft The Netherlands, discussing ‘Opportunities for unsaturated soil mechanics in the geotechnical practice: a few case histories’.

The second Panel Session was chaired by Prof. Daichao Sheng, from UTS Australia, and focussed on fundamental approaches to unsaturated soil mechanics (Fig. 5). Three complementary views were given by Prof. Jean-Michel Pereira, from ENPC Paris, talking on ‘Effective stress in unsaturated soils: a microstructure perspective’, Dr. João Ribas Maranha, from LNEC Lisbon, presenting ‘Effective stress in unsaturated soils: lessons from capillarity in regular sphere arrangements’, and Prof. Jean Vaunat, from UPC Barcelona, closing with a contribution on ‘Effective stress and microstructure in unsaturated soils’.

All the rest of the programme was organised in parallel sessions, which allowed presenting and discussing all the contributions submitted. Two parallel sessions were devoted to special topics which are attracting increasing attention. These special sessions were on Reuse of Geomaterials, chaired by Prof. Olivier Cousinier from Université de Lorraine, and on Biocementation, chaired by Annette Esnault-Filet, project leader at Soletanche Bachy France, and Dr. Xueyu Geng from University of Warwick.

Selected sessions during the second day of the conference were offered to the Portuguese Technical Community as a continuing education short course led by Prof. Rafaela Cardoso, IST Lisbon, and entitled ‘Geotechnical works and case studies where the degree of saturation of the soils should be considered’. The initiative was supported by FUNDEC (https://www.fundec.pt/en/) and collected 16 participants.
Conference reports (Con’t)
The 4th European Conference on Unsaturated Soils, 19 -21 October, 2020 (online)

The conference ended with some words from the co-chairs and the Chair of TC106. Updates on the activities of the organising committees of the forthcoming events supported by TC106 were given. Prof. Gilson Giritana Jr. from Brazil informed about PanAm Unsat 2021, and Prof. Michael Bardanis from Greece introduced the 8th International Conference on Unsaturated Soils to be held in 2022.

The feedback from the participants was very positive, though warm conversation during coffee breaks, social activities and the gala dinner were truly missed.

In total 141 papers were accepted for publication in the conference proceedings, which are fully open-access available online at the link https://www.e3s-conferences.org/ (number 95). All the contributions underwent careful peer review before acceptance. Among the authors, from 46 countries, nearly 50% of the total number were coming from outside Europe (Asia, North America, South America, Africa and Australia), thereby confirming the worldwide interest of Unsaturated Soils in the scientific community.

The papers collected in the proceedings include contributions on environmental problems (engineered barriers to protect the environment, the reuse of waste materials, climate stresses, sustainable geotechnical design) and new technologies (energy geotechnics and bio-inspired technologies) besides more traditional geotechnical engineering applications. They were divided into six broad sections: three cover the development of theoretical, numerical and experimental approaches, unsaturated soils characterisation and applications to a variety of field problems, and three thematic sections, include rather new fields of study and suggest new horizons of our research in engineering applications, showing the present intense effort of the community on protecting the environment and improving sustainability in a changing world. Contributions also came from some ongoing large European research projects inside TC106 Unsaturated Soils community.

The co-chairs thank Prof. David Toll, Chair of the TC106, and the Secretary of the Technical Committee, Prof. Adrian Russell, for the continuous support they gave to the organisation, and to the sponsors GDS Instruments and VJTech who remained on board despite the unusual virtual format.

Rafaela Cardoso, Cristina Jommi and Enrique Romero
Call for Papers: 12th International Conference on Geosynthetics, Roma, Italy, 18 – 22 Sep 2022

Exceptionally for ISSMGE members, the conference organizer extends the abstract submission deadline to 15th March 2021 for the 12th International Conference on Geosynthetics (ICG).

The 12th ICG is set to take place in Roma, Italy, on September 18-22, 2022, at the stunning Auditorium Parco della Musica designed by the archi-star Renzo Piano. Co-organized by the Italian Geotechnical Society (AGI) and the Italian Chapter of the IGS (AGI-IGS), the conference is themed ‘Geosynthetics: leading the way to a resilient planet’.

Please submit abstracts through the conference website: https://www.12icg-roma.org

The website contains also the detailed submission guidelines, while the conference topics on which the papers should be based are as following:

**Topics**

<table>
<thead>
<tr>
<th>Sustainability with Geosynthetics</th>
<th>Landfills and remediation of contaminated sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geosynthetics Properties and Testing</td>
<td>Filtration and Drainage</td>
</tr>
<tr>
<td>Soil-Geosynthetic Interaction</td>
<td>Erosion Control and coastal applications</td>
</tr>
<tr>
<td>Durability and Long Term Performance</td>
<td>Hydraulic applications: canals, reservoirs and dams</td>
</tr>
<tr>
<td>Reinforced Walls and Slopes</td>
<td>Innovative materials and technologies</td>
</tr>
<tr>
<td>Basal reinforced Embankments, GEC, piles and shallow foundations</td>
<td>Design approaches and other applications</td>
</tr>
<tr>
<td>Seismic design with geosynthetics</td>
<td>Case Histories</td>
</tr>
<tr>
<td>Unpaved and paved roads</td>
<td>Mining applications</td>
</tr>
<tr>
<td>Railways and other Transportation Applications</td>
<td>Tunnels and underground constructions</td>
</tr>
</tbody>
</table>

Successful applicants will be notified by April 15, 2021, and required to submit a full paper with further deadlines later in the year.

*Daniele Cazzuffi*  
AGI-IGS President and 12 ICG Co-Chair
Geotechnics fundamentals and applications in construction: investigations, design, technologies (GFAC 2021)
Venue: Conference hall of Saint Petersburg State University of Architecture and Civil Engineering

GFAC 2021 scope:
GFAC 2021 is to provide an ideal interdisciplinary platform to share research results in the sphere of geotechnics, modern geotechnologies, soil mechanics, foundations, geological engineering and share experience in design of complex geotechnical objects in various conditions (https://gfac.spbgasu.ru/en/).

GFAC topics:
- Special field and laboratory methods of investigating physical and mechanical properties of soils
- Theoretical and practical aspects of soil mechanics
- Models of soil bases and their application in design
- Geotechnical justification, scientific and technical support for engineering survey, design, construction and operation of foundations, underground and earth structures
- Numerical modelling of the "base-foundation-structure" system in software complexes
- Innovative technological solutions in the construction of bases, foundations, underground structures and high-rise buildings
- New construction and reconstruction of buildings and structures in dense urban development and on structurally unstable soils
- Exploring the properties of frozen and thawing soils, foundation constructions and applicable engineering methods
- Geotechnical monitoring in the construction and operation of buildings and structures
- Analysis of the causes of accidents and emergency situations in the design and construction of foundations for buildings and structures

CONFERENCE SECRETARIAT CONTACT DETAILS
Filipp Kalach - Deputy Scientific Secretary
Mob: +7 (921) 847-92-93
E-mail: GFAC-2021-SPBGASU@yandex.ru
Post Address: 7, 3rd Krasnoarmeyskaya St., Saint Petersburg, Russia, 190005 (Department of Geotechnics, SPbGASU)
Obituary

Professor Richard D. Woods

Extract from a message by Prof. Roman D. Hryciw in USUCGER

Sad news - Professor Richard D. Woods

It is with great sadness that we share the news that Professor Dick Woods passed away on January 27, 2021 with his family by his side.

Richard D. Woods was born September 4, 1935 to Andrew and Beryl (Evens) Woods in Lansing, Michigan. He graduated from Sexton High School in Lansing in 1953, obtained a BS in Civil Engineering in 1957, MS in Civil Engineering in 1962 from Notre Dame University. From September 1957 through August 1960 he served in the United States Marine Corps as an engineering officer. In 1967 he received his Ph.D in Civil Engineering from the University of Michigan and went on to become a member of the University of Michigan faculty for over 35 years.

Before beginning his career at the University of Michigan, Professor Woods served as a lieutenant in the U.S. Marine Corps, conducted research at the Air Force Weapons Laboratory at Kirkland Air Force Base, and taught at Michigan Technological University in Houghton. Professor Woods joined the University of Michigan faculty as an Assistant Professor in 1967 and was promoted to Associate Professor in 1971 and Professor in 1976. He served as the Chair of the Department of Civil and Environmental Engineering from 1994 to 2001. After formal “retirement” from the University of Michigan, Professor Woods taught at Notre Dame University one semester each year for nearly a decade. Reestablishing himself in Ann Arbor, Professor Woods once again taught graduate classes and advised PhD students at the University of Michigan throughout the 2010’s. His geotechnical engineering consulting efforts would continue through 2020.

Prof. Woods is best known for his pioneering research in soil dynamics, foundation engineering, and engineering geophysics. He authored over 80-refereed publications and chaired 21 Ph.D. theses. Among Professor Woods’ numerous awards are the Collingwood Prize from the American Society of Civil Engineers and the Terzaghi Lectureship from the ASCE Geotechnical Engineering Division. He was inducted into the National Academy of Engineering in 2003.

In addition to being a giant in our field, Professor Woods was an extremely gracious and kind colleague and mentor who loved the University of Michigan and his friends and collaborators throughout the world. He was a driving force in the ASCE Geo-Institute and in USUCGER. Dick will be dearly missed.

Dick was preceded in death by his wife of 55 years, Dixie L. (Davis) Woods, in 2012 and his daughter Kathleen (Woods) Laird in 1981. He is survived by his daughters, Cecilia Woods of Dexter and Karen Woods Bochenek (Andrew) of Royal Oak, grandson Trevor Laird (Nina) of Glasgow, Scotland, granddaughters Jane Woods (Ross) of Cincinnati, Ohio, Audi Woods of Ypsilanti, Sarina (Parks) Pankey (Kevin) of Belleville, Tori Parks of Ypsilanti, great granddaughters Daisha Wilson, Siobhan Woods, Alanna Armstrong, Hella Woods, and great grandsons Zyhare Scott, and Kevin Pankey Jr.

Rest in peace Professor Woods.
ISSMGE EVENTS

Please refer to the specific conference website for full details and latest information.

2021

International Conference on Challenges and Achievements in Geotechnical Engineering
Location: POLIS University campus, Albania, Tirana
Dates: 31-03-2021 - 02-04-2021
Language: English
Organiser: Albanian Geotechnical Society
Contact person: Erdi Myftaraga
Phone: +355699336911
Email: emy@greengeotechnics.com

Second International Conference on Geotechnical Engineering-Iraq 2021
Location: Online Akre/ Duhok/Iraq
Dates: 05-04-2021 - 06-04-2021
Language: English
Organiser: Iraqi Scientific Society of Soil Mechanics and Foundation Engineering
Contact person: Mahdi O Karkush
Address: University of Baghdad, Aljadriah, Baghdad
Phone: 00964780105893
Email: mahdi_karkush@coeng.uobaghdad.edu.iq
Website: http://ocs.uobaghdad.edu.iq/index.php/icgeotecheng/icgte

2nd Vietnam Symposium on Advances in Offshore Engineering
Location: Ho Chi Minh City University of Technology, Vietnam
Dates: 22-04-2021 - 24-04-2021
Language: English
Organiser: Association of Vietnamese Scientists and Experts; Ho Chi Minh City University of Technology
Contact person: Dinh Hong DOAN
Email: vsoe2021@sciencesconf.org
Website: https://vsoe2021.sciencesconf.org/

4th International Conference on Transportation Geotechnics (4th ICTG)
Location: Sheraton Grand Chicago, USA
Date: 23-05-2021 – 26-05-2021
Organiser: Professor Erol Tutumluer, 4th ICTG Chairman and Chair of ISSMGE TC 202,
Contact Information: Professor Erol Tutumluer,
Address: 1205 Newmark CEE Laboratory, MC-250 205 N. Mathews,
Phone: +1 (217) 333-8637,
Email: CITL-ICTG2020@illinois.edu,
Website: http://www.conferences.illinois.edu/ICTG2020
XXV Congreso Argentino de Ingeniería Geotécnica - CAMSIG
Location: Parque del Conocimiento - Posadas, Misiones, Argentina
Dates: 26-05-2021 - 28-05-2021
Language: Spanish
Organiser: Sociedad Argentina de Ingeniería Geotécnica
Contact person: Andres Ayala
Address: Av. Ulises López, N3300 Posadas,
Email: camsig2020.misiones@gmail.com; secretariat@saig.org.ar
Website: https://camsig2020.com/

Mediterranean Symposium on Landslides
Location: Congressi Partenope, Naples, Italy, Naples
Date: 07-06-2021 - 09-06-2021
Language: English
Organiser: Gianfranco Urciuoli (Università di Napoli Federico II), Giovanni Crosta (Università di Milano Bicocca), Luciano Picarelli (Università della Campania L. Vanvitelli)
Contact person: Università di Napoli Federico II
Email: medsymplandslides@gmail.com
Website: https://medsymplandslides.wixsite.com/msl2021

The 2nd International Conference on Press-In Engineering 2021, Kochi
Location: Kami Campus, Kochi University of Technology, Japan
Dates: 19-21 June, 2021
Language: English
Organiser: International Press-in Association (IPA)
Contact person: ICPE2021 Organizing Committee
Address: 5F, Sanwa Konan Bldg, 2-4-3 Konan, 2-4-3 Konan, Minato-ku
Phone: +81-(0)3-5461-1191
Fax: +81-(0)3-5461-1192
Email: icpe2021@gmail.com
Website: https://icpe-ipa.org/

The 1st International Conference on Sustainability in Geotechnical Engineering - Geodiversity & Resilience (1ST ICSGE’21)
Location: The Congress Center of LNEC Lisbon, Portugal, Lisboa
Date: 27-06-2021 - 30-06-2021
Organiser: The National Laboratory for Civil Engineering (LNEC)
Contact person: LNEC Congress Centre Secretariat
Address: Avenida do Brasil, 101 1700-066 Lisboa
Phone: (+351) 218 443 483
Email: formacao@lnec.pt
Website: http://icsge.lnec.pt/
6th Geochina International Conference 2021
Location: NanChang, China
Date: 19-07-2021 - 21-07-2021
Organiser: East China Jia Tong University in Cooperation with Chinese Ministry of Education, GeoChina Civil Infrastructure Association, University of Oklahoma
Contact person: Dr. Dar Hao Chen; Address: Texas Transportation Institute; Email: d-chen@tti.tamu.edu;
Website: http://geochina2021.geoconf.org; Email: geochina.adm@gmail.com

3rd Pan-American Conference on Unsaturated Soils
Location: PUC-Rio, in Rio de Janeiro, Brazil,
Date: 25-07-2021 - 28-07-2021
Organiser: Tácio de Campos (PUC-Rio), Fernando Marinho (USP), Gilson Gitirana (UFG)
Contact person: Tácio de Campos
Email: panam2021unsat@puc-rio.br
Website: https://panamunsat2021.com

7th International Young Geotechnical Engineers Conference
Location: International Convention Centre, Sydney, Australia
Dates: 10-09-2021 - 12-09-2021
Language: English
Organiser: Australian Geomechanics Society
Contact person: ICMS Australasia
Address: Level 9, 234 George Street, Sydney NSW, 2000
Phone: (+61 2) 9254 5000
Email: info@icsmge2021.com
Website: http://icsmge2021.org/7iygec/

20th International Conference on Soil Mechanics and Geotechnical Engineering
Location: International Convention Centre Sydney, Australia
Date: 12-09-2021 - 17-09-2021
Language: English
Organiser: The Australian Geomechanics Society;
Contact person: ICMS Australasia;
Address: Level 9, 234 George Street Sydney NSW 200;
Email: emmab@icmsaust.com.au;
Website: http://www.icsmge2021.org/

The 10th International Conference on Scour and Erosion (check conference website for updates) - October 17-20, 2021
Location: DoubleTree Washington DC - Crystal City, USA,
Date: 17-20 October 2021
Language: English
Organiser: Geotechnics of Soil Erosion Committee, ASCE Geo-Institute; Contact person: Ming Xiao (ICSE-10 Chair); Address: Pennsylvania State University; Phone: 010-814-865-8056;
Email: mxiao@ engr.psu.edu;
Website: https://www.engr.psu.edu/xiao/ICSE-10%20Call%20for%20abstract.pdf
3rd International Conference on Geotechnical Engineering - New Dates
Location: Cinnamon Grand, Colombo, Sri Lanka
Dates: 06-12-2021 - 07-12-2021
Language: English
Organiser: Sri Lankan Geotechnical Society
Contact person: Dr. JSM Fowze
Address: 415, Baudhaloka Mawatha
Phone: +94-71-417-1239
Fax: +94-11-266-8956
Email: slgssecretariat@gmail.com
Website: http://icgecolombo.org/2020/index.php

4th International Symposium on Frontiers in Offshore Geotechnics
Location: University of Texas, Austin, United States
Date: 08-11-2021 - 11-11-2021
Language: English
Organizer: ISFOG 2020 Organising Committee
Contact person: Phil Watson
Address: The University of Western Australia
Phone: 0418881280
Email: phillip.watson@uwa.edu.au
Website: http://www.isfog2020.org

XI Congreso Chileno de Geotecnia
Location: Universidad de Talca, Chile
Dates: Talca 22-11-2021 - 24-11-2021
Language: Spanish
Organiser: Chilean Geotechnical Society
Contact Information
Contact person: Macarena Tugas
Email: coordinadorasochige@gmail.com
Website: http://www.sochige.cl
Email: directorio@sochige.cl

3rd International Conference on Geotechnical Engineering
Location: Cinnamon Grand, Colombo, Sri Lanka
Dates: 06-12-2021 - 07-12-2021
Language: English
Organiser: Sri Lankan Geotechnical Society
Contact person: Dr. JSM Fowze
Email: slgssecretariat@gmail.com
Website: http://icgecolombo.org/2020/index.php
2022

2nd International Conference on Energy Geotechnics
Location: Robert Paine Scripps Forum for Science, Society and the Environment. La Jolla, CA, USA.
Date: 10-04-2022 - 13-04-2022
Language: English
Organiser: John McCartney (UC San Diego, USA) and Ingrid Tomac (UC San Diego, USA),
Contact Information: ICEGT-2020 Secretariat,
Address: 9500 Gilman Dr., La Jolla CA,
Phone: +1-858-822-5212,
Fax: +1-858-822-2260,
Email: secretariat@icegt-2020.com,
Website: https://icegt-2020.eng.ucsd.edu/home

5th International Symposium on Cone Penetration Testing (CPT’22)
Location: Centro Congressi CNR, Bologna, Italy
Language: English
Organiser: Italian Geotechnical Society (AGI) and University of Bologna (endorsed by TC102)
Contact person: Susanna Antonielli (AGI), Prof. Guido Gottardi (University of Bologna)
Email: guido.gottardi2@unibo.it; agi@associazionegeotecnica.it

9th International Congress on Environmental Geotechnics
Location: Chania, Crete island, Greece,
Language: English
Organiser: Chair: Dimitrios Zekkos, University of California at Berkeley ; zekkos@berkeley.edu
Contact person: Dr. Rallis Kourkoulis
Email: rallisko@grid-engineers.com
Website: https://www.iceg2022.org/

TC204: Geotechnical Aspects of Underground Construction In Soft Ground - TC204 Cambridge 2021
Location: University of Cambridge, United Kingdom
Date: 28-06-2021 - 30-06-2021
Language: English
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: me254@cam.ac.uk

28th European Young Geotechnical Engineers Conference and Geogames
Location: National Research Moscow State University of Civil Engineering, Russia, Moscow
Date: 15-09-2022 - 17-09-2022 - 19-12-2022
Language: English
Organiser: Russian Society for Soil Mechanics, Geotechnics and Foundation Engineering
Contact person: PhD Ivan Luzin
Address: NR MSUCE, 26 Yaroslavskoye shosse
Phone: +7-495-287-4914 (2384)
Email: youngbuoro@gmail.com
Additional Information: https://t.me/EYGEC2020
Location: De Doelen, Rotterdam, The Netherlands,
Dates: 20-09-2022 - 23-09-2022
Language: English
Organiser: Royal Netherlands Society of Engineers (KIVI)
Contact person: Angelique van Tongeren
Address: Prinsessegracht 23
Phone: +31(0)70-3919890
Email: SW2022@kivi.nl
Website: https://www.kivi.nl/afdelingen/geotechniek/stress-wave-conference-2022

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16th International Conference of the International Association for Computer Methods and Advances in Geomechanics - IACMAG
Location: Politecnico di Torino Conference Centre, Italy
Dates: 03-05-2021 - 04-05-2021
Language: English
Organiser: Politecnico di Torino
Contact person: Symposium srl
Address: via Gozzano 14
Phone: +390119211467
Email: info@symposium.it, marco.barla@polito.it

Fifth International Conference on New Developments in Soil Mechanics and Geotechnical Engineering
Location: Atatürk Cultural and Congress Center Near East University, Nicosia, Northern Cyprus
Dates: 27-05-2021 - 29-05-2021
Language: English
Organiser: Turkish Society of Soil Mechanics and Geotechnical Engineering and Near East University
Contact person: Cavit ATALAR
Address: Near East Boulevard
Phone: 0090392 223 6464
Website: http://zm2020.neu.edu.tr
Email: zm.2020@neu.edu.tr

The Third International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering
Location: Dokuz Eylul University, Izmir, Turkey,
Dates: 17-06-2021 - 19-06-2021
Organiser: Dokuz Eylul University
Contact person: Tugce Ozdamar Kul
Address: Dokuz Eylul University
Phone: +905325164800
Email: egrwse2020@gmail.com
Website: http://www.egrwse2020.com
DFI Deep Mixing 2021
Location: Polish Baltic Philharmonic and Congress Centre, Gdansk, Poland
Dates: 05-07-2021 - 08-07-2021
Language: English
Organizer: Deep Foundations Institute
Contact person: Theresa Engler
Address: 326 Lafayette Avenue
Phone: 9734234030
Email: tengler@dfi.org
Website: http://www.dfi.org/DM2021

7th International Conf. on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics
Location: The National Science Seminar Complex, Indian Institute of Science Bangalore, India,
Date: 12-07-2021 - 17-07-2021
Organiser: Indian Society of Earthquake Technology
Website: http://7icragee.org/index.php
Email: conf@7icragee.org

Fifth World Landslide Forum
Location: Kyoto International Conference Center, Kyoto, Japan
Dates: 02-11-2021 - 06-11-2021
Organizer: International Consortium on Landslides
Contact person: Ryosuke Uzuoka
Address: Gokasho
Phone: +81-774-38-4090
Email: zuoaka.ryosuke.6z@kyoto-u.ac.jp
Website: http://wlf5.iplhq.org/
Email: secretariat@iclhq.org

Fourth African Regional Conference on Geosynthetics
Location: Cairo, Egypt
Dates: 21-02-2022 - 24-02-2022
Language: English
Organiser: International Geosynthetics Society- Egypt Chapter
Contact person: Prof. Fatma Baligh
Address: 87 El-Tahrir St., Dokki, Giza, Egypt
Email: Secretariat@geoafrica2021.org; info@geoafrica2021.org
Website https://geoafrica2021.org/;

12th International Conference on Geosynthetics
Location: Auditorium Parco della Musica, Rome, Italy
Dates: 18-09-2022 - 22-09-2022
Language: English
Organiser: Associazione Geotecnica Italiana - Italian Chapter of IGS
Contact person: Susanna Antonielli
Address: AGI-Viale dell'Università 11
Phone: +39 06 4465569
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Email: info@12icg-roma.org
Website: http://www.12icg-roma.org

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