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Research highlights

Institute for Geotechnical Engineering, ETH Zurich

ETH Zurich

Founded by the Swiss Federal Government in 1854, the Swiss Federal Institute of Technology, ETH Zurich, is consistently ranked among the top universities in the world. It currently ranks 6th in the world according to the QS World University Rankings. A total of 21 Nobel Prizes have been awarded to students or professors of ETH Zurich, the most famous being Albert Einstein (1921 Nobel Prize in Physics) and Niels Bohr (1922 Nobel Prize in Physics). With its 16 Departments, ETH Zurich covers a broad academic spectrum. The departments are composed of institutes or laboratories, professorships and department-specific bodies.

Institute for Geotechnical Engineering

The Institute for Geotechnical Engineering is one of the 10 Institutes of the Department of Civil, Environmental and Geomatic Engineering. The Institute is responsible for teaching, research and provision of services across the entire spectrum of soil and rock mechanics through to clay mineralogy, as well as in geotechnical engineering and environmental geotechnics. The Institute for Geotechnical Engineering strives for excellence in geotechnical modelling of the ground, including soil-structure interaction, underground structures, geotechnical natural hazards, transportation-geotechnics, as well as clay mineralogy and geotechnical monitoring. This knowledge flows directly into teaching and services, including specialist laboratory and field testing, expertise and continuing professional education.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

Research Groups

The research activities of the institute are carried out by four research groups, which cover a wide range of areas in geotechnical engineering:

- Chair of Underground Construction (Prof. Anagnostou)
- Chair of Geotechnical Engineering - Geomechanics (Prof. Puzrin)
- Chair of Geotechnical Engineering (Prof. Anastasopoulos)
- Geo-environmental Engineering and Clay Mineralogy Research Group (Dr. Plötze)

Research Areas

Research areas include important topics of foundation engineering, tunnelling, soil and rock mechanics, and environmental engineering. Current projects focus primarily on:

- Geotechnical design (typically including soil-structure interaction, tunnelling, foundation engineering, geosynthetics-geosystem engineering, transportation geotechnics, flood-protection works, earthquake engineering);
- Stability analysis (natural and engineered soil slopes and rock walls);
- Sustainability of geo-structures (for example, in environmental geotechnics);
- Development and application of novel sensor technologies in geotechnical monitoring;
- Complex coupled processes often underlying natural and potential anthropogenic hazards (such as radioactive-waste disposal, including important aspects of clay mineralogy and problems relating to unsaturated soil mechanics).



Prof. Georgios Anagnostou

Chair of Underground Construction
MSc in Civil Engineering, University of Karlsruhe
PhD in Rock Mechanics, ETH Zurich

Prof. Anagnostou's research deals mainly with tunnelling through squeezing or swelling rock, stability and deformation issues of mechanized tunnelling in rock or soft ground and geotechnical auxiliary measures such as advance drainage, artificial ground freezing, face reinforcement and forepoling. A recent research topic concerns rock mechanical aspects of underground compressed air energy storage. Prof. Anagnostou has been involved as a tunnelling expert or consultant in major infrastructure projects such as the Gotthard and the Ceneri base tunnels (Switzerland), the Bosphorus subsea motorway tunnel (Turkey), the Gibraltar strait tunnel (Morocco - Spain), the Athens Metro (Greece) and the Lake Mead Intake Tunnel No 3 (USA).

Current research topics

1 Tunnelling in squeezing ground

Squeezing is the phenomenon of large, often time-dependent, deformations that develop when tunnelling through weak rocks, particularly under a great depth of cover. The large Swiss alpine tunnelling projects have triggered considerable research over the last decade, about the mechanical behaviour of squeezing rocks; the effect of geometric nonlinearities associated with very large deformations; the conceptual design and the dimensioning of segmental linings in shield tunnelling through squeezing ground; the pressure developing upon tunnel boring machines and the problem of shield jamming (Fig. 1b); the interplay between squeezing ground and yielding supports; and the reasons of the observed variability of squeezing intensity during tunnelling. The experimental techniques and computational methods that have been developed at ETH Zurich have been applied in a series of projects such as the Ceneri Base Tunnel, the Semmering Base Tunnel in Austria, the Strait of Gibraltar Tunnel, the Uluabat Tunnel in Turkey and the Lake Mead project in the United States.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

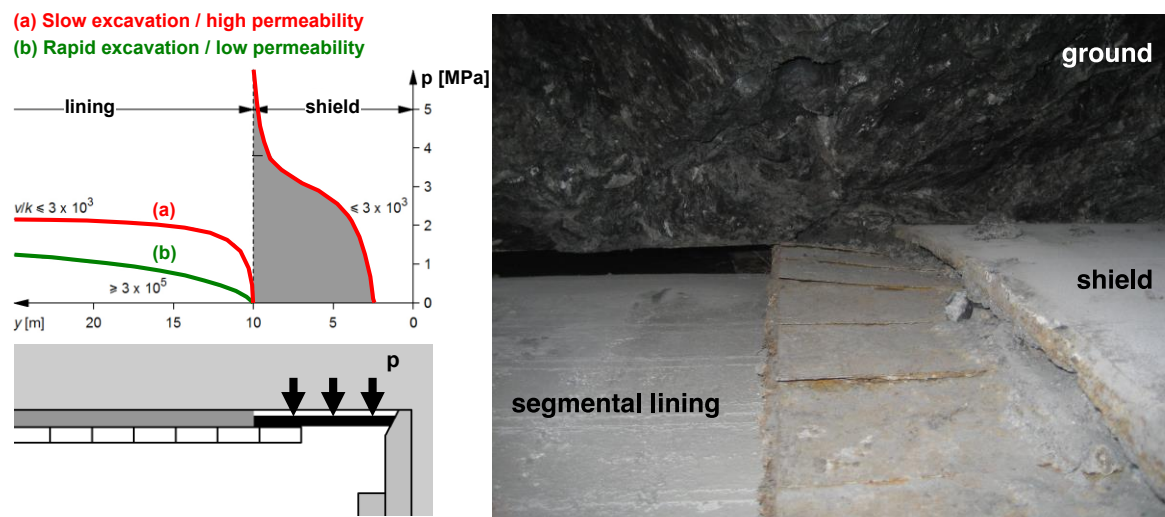


Figure 1. Load distribution along the shield and lining

Current research aims to analyse the face stability of deep tunnels through heavily squeezing ground, considering the softening and the geometric nonlinearity associated with the large, excavation-induced extrusion of the ground at the face. Another question under investigation concerns the shield and lining loading developing during TBM advance in a ground that experiences creep and consolidation (Fig. 1).

2 Tunnelling in swelling rock containing anhydrite

Swelling rocks increase in volume when interacting with water. In tunnelling, the swelling causes a heave of the tunnel floor, which may impair the serviceability of the structure or even damage the tunnel lining. Particularly problematic (in terms of swelling deformations and pressures) are claystones containing anhydrite. They are widely distributed in Switzerland and Southwest Germany and have caused serious damage, lengthy operational disruptions and very costly repairs in a number of tunnels (Fig. 2a).

The swelling of anhydritic claystones is mainly caused by the chemical transformation of anhydrite into gypsum. Past theoretical and experimental research in Prof. Anagnostou's group focused mainly on the fundamental mechanisms underlying the macroscopically observed swelling behaviour of anhydritic claystones and improved understanding about: the thermodynamics and kinetics of the involved chemical reactions (anhydrite dissolution and gypsum precipitation); the effect of diffusion; the reasons for the occurrence of anhydrite rather than gypsum at shallow depths; the relationship between the crystallisation pressure of gypsum and the macroscopically developing swelling pressure; the effect of sealing of the anhydrite by the formed gypsum on the time development of swelling; and the effect of confining pressure on the swelling strains.

On-going research deals with the swelling in the scale of underground openings. Specifically, a multi-coupled computational model is developed (taking account of chemically induced strains and stresses, seepage flow and ionic transport) with the aim to analyse the processes around tunnels in anhydritic claystones and to predict the swelling-induced deformations and rock pressures.

A further research subject is the technological and economic feasibility of a novel tunnel rehabilitation method, which makes use of a known thermodynamic property of the anhydrite-gypsum-water system. Specifically, considering that anhydrite is stable at temperatures above 40 - 50 °C, it is investigated for a particularly problematic Swiss tunnel how and with which energy consumption one could control the swelling deformations via heating of the rock (Fig. 2).

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich



(a)

(b)

Figure 2 (a) Extreme floor heave in a Swiss tunnel; and (b) temperature field around a tunnel with thermal control of swelling

3 Geotechnical auxiliary measures

Auxiliary geotechnical measures such as grouting, artificial ground freezing, advance drainage, face reinforcement and forepoling are mostly undertaken from the tunnel face, alternating with the actual excavation and support works, thus rendering tunnelling very slow and expensive. Therefore, they need a careful design (considering geotechnical, constructional and technological aspects) and this triggered considerable research activities at the ETH, particularly about the effectiveness and feasibility of advance drainages, the stability of reinforced tunnel faces and the design of artificial ground freezing under seepage flow conditions. Current research deals with the structural design of forepoling and with artificial ground freezing of alternating aquifers and aquitards with locally high seepage flow velocities.

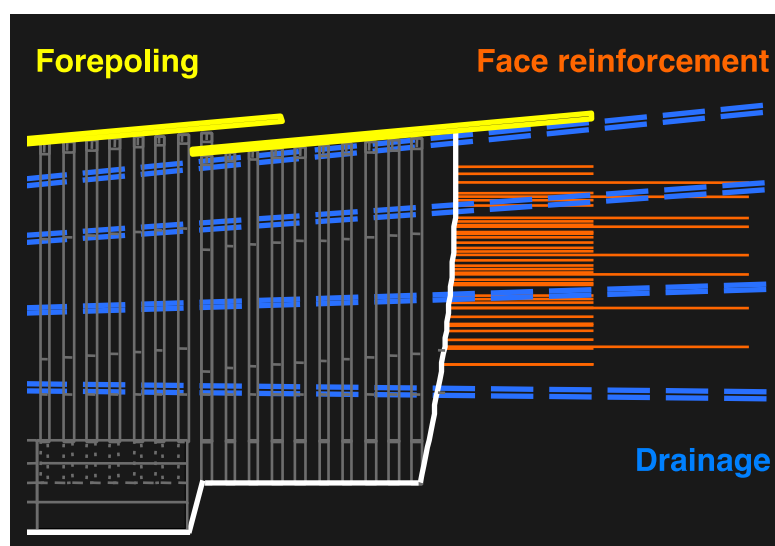


Figure 3. Common auxiliary measures in tunnelling through weak ground

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

4 Compressed air energy storage (CAES)

Underground CAES makes use of the high resistance of the surrounding rock mass to the internal gas pressure. Key design issues are: uplift failure of the overlying rock up to the surface; deterioration and loss of tightness of the lining due to the cyclic pressure and temperature loading during operation; shearing of the plug closing the cavern (Fig. 4). Current research deals with the sealing system and with the optimization of the cavern layout.

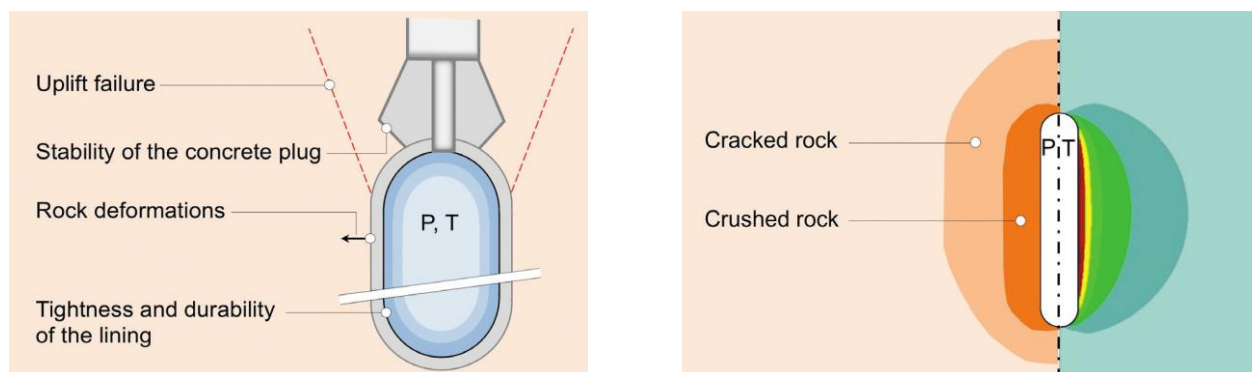


Figure 4. Key rock mechanical aspects of underground CAES



Prof. Alexander M. Puzrin

Chair of Geotechnical Engineering Geomechanics

BSc and MSc in Civil Engineering, Moscow Institute of Civil Engineering

PhD in Geotechnical Engineering, Technion - Israel Institute of Technology

Prof. Puzrin's main research interests are geohazards, constitutive modeling of geomaterials, progressive and catastrophic failure in soils with applications to slope stability and retaining structures. Other interests include novel sensor technologies for geotechnical monitoring, forensic geotechnical engineering and mitigation of geotechnical eco-hazards. He has been involved as an expert and consultant in large-scale onshore and offshore geotechnical projects in the UK, the US, Switzerland, Mexico, Azerbaijan, Russia, and Israel. He is a co-founder of the ETH Zurich spin-off company Marmota Engineering AG providing high-tech fiber-optics monitoring services to industry.

Current research topics

1. Submarine landslide evolution

The goal of this research effort is to quantify submarine landslide hazards by creating a powerful computational platform for mechanically consistent explanation of dynamic landslide evolution and predicting likelihood of future landslide events and their consequences. The seafloor of continental slopes, lakes and river deltas bears hidden scars of enormous submarine landslides. Their consequences include tsunami waves, underwater debris flows and offshore failures retrogressing onshore, causing loss of life and property. What caused them and can they happen again, and where?

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

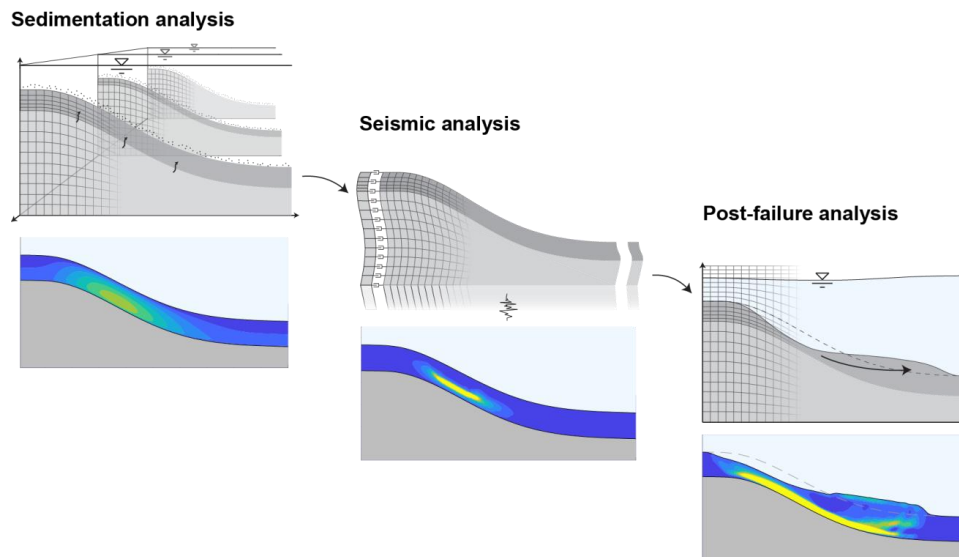


Figure 5. Three-step analysis of submarine landslide evolution

Currently, the following research topics are supported by the Swiss National Science Foundation:

- Constitutive modelling and laboratory testing of clays under cyclic loading
- Pre-conditioning and seismic triggering of submarine landslides
- Investigation of post-failure behavior of submarine Landslides
- Application of the shear band propagation to the GIS based 3D slope stability analysis

2. Risk assessment and construction on permanent landslides

Permanent landslides are quite common in mountainous regions and are characterised by their slow, continuous creeping movement. Communities are expanding into such regions, overbuilding large areas of permanent landslides, with many buildings getting damaged over their life span. A special class of problems concerns artificial water reservoirs, where acceleration of continuous creeping movement of the reservoir flanks endangers both the reservoir operation and the downstream communities. The goal of this research effort is to develop methodology for the short and long-term risk assessment and management associated with creeping landslides, with particular emphasis on their interaction with infrastructure and on their response to earthquakes and extreme weather events affected by global climate changes.

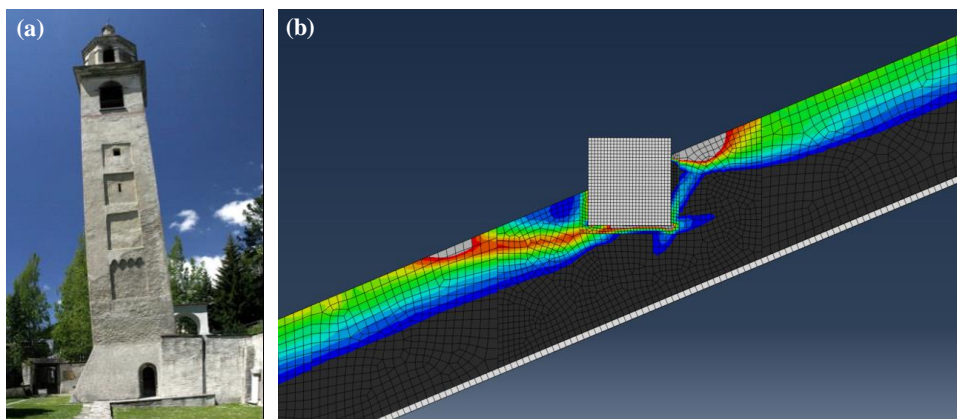


Figure 6. (a) The leaning tower of St. Moritz; (b) failure mechanisms for a landslide-embedded structure

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

Currently, the following research topics have been supported by the Swiss National Science Foundation, Swiss Federal Office of Energy and Swiss Federal Office of Environment:

- Creeping-constrained landslides under extreme conditions
- Principles of construction on permanent landslides
- Seismic behaviour of creeping landslides at the flanks of water reservoirs

3. *Novel sensor technologies for geotechnical monitoring and research*

The use of fibre optics (FO) as sensing system for geotechnical and structural health monitoring is rapidly growing, thanks to their many qualities: optical fibre sensors are immune to electromagnetic fields, chemically and biologically inert, small and lightweight; they can withstand high temperatures; the signal can be transported for kilometres. FO sensors used for strain monitoring in civil engineering face two important challenges: on one hand, they need a good mechanical contact between the fibre sensor and the structure (or soil) to follow the movements, while on the other hand they must be protected from mechanical damage. The goal of this research effort is to explore novel applications of the FO sensing for geotechnical and structural research and monitoring.

Currently, the following research topics have been supported by the Swiss Federal Office of Transportation, National Cooperative for the Disposal of Radioactive Waste (NAGRA) and Innosuisse - Swiss Innovation Agency (in collaboration with HSR, Gehlma AG and Marmota AG):

- Non-destructive analysis of pavements by means of distributed FO technology
- Distributed FO sensing for nuclear waste disposal
- Assessment and optimization of self-drilling pile foundations using distributed FO sensors
- Surface-object identification using ground-buried FO sensors
- Failure behaviour of cantilever retaining walls - soil-structure interaction and monitoring



Figure 7. Application of novel sensor technologies: (a) pile test; (b) object identification test

4. *Risk assessment and mitigation of geotechnical eco-hazards*

Geotechnical failures and environmental pollution are often interrelated, creating a special type of hazards: Geo-Eco-Hazards. In the past 10 years, the unique combination of expertise shared by Dr. Michael Ploetze's Clay Lab and Prof. Puzrin's Chair allowed for successful investigation of challenging geo-eco-hazard problems in the USA, Mexico, Italy and Israel, and for prevention of potential geotechnical failures leading to ecological catastrophes in Azerbaijan and Switzerland. This work has demonstrated that there is a clear need in a pro-active multidisciplinary approach for geo-eco-hazard assessment and mitigation.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

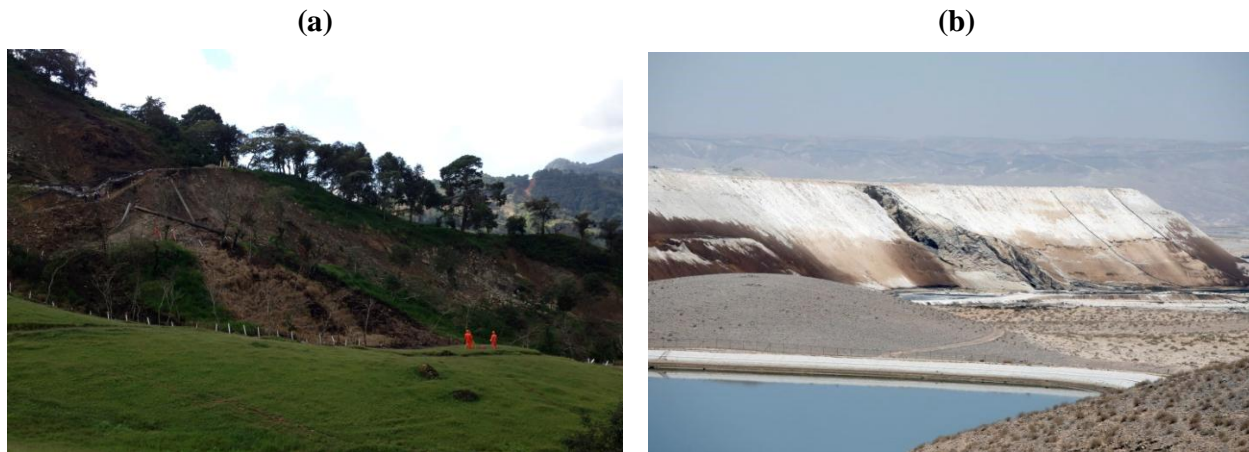


Figure 8. (a) landslide breaks an oil pipeline in Mexico; (b) Phosphogypsum stack collapse in Israel.

Currently, the following problems are investigated in collaboration with Dr Michael Ploetze's Clay Lab:

- Geotechnical aspects of the phosphogypsum stack stability
- Stability of tailing dams (collaboration with the University of Sao Paulo, Brazil)
- Mitigation of offshore pollution (collaboration with the Politecnico di Bari, Italy)



Prof. Ioannis Anastasopoulos

Chair of Geotechnical Engineering
 Diploma in Civil Engineering, National Technical University of Athens
 MSc in Civil Engineering, Purdue University, West Lafayette, IN
 PhD in Civil Engineering, National Technical University of Athens

Prof. Anastasopoulos specializes in geotechnical earthquake engineering and soil-structure interaction, combining numerical with experimental methods. His research interests include the development of innovative seismic hazard mitigation techniques, faulting and its effects on infrastructure, site effects and slope stabilization, railway systems and vehicle-track interaction, offshore geotechnics, and earthquake crisis management systems. He has been involved as a consultant in a variety of projects of significance in Europe, but also in the US and the Middle East. His consulting work ranges from special seismic design of bridges, buildings, retaining walls, metro stations and tunnels, to harbor quay walls, and special design against faulting-induced deformation applying the methods he has developed. He is the inaugural recipient of the Young Researcher Award of the ISSMGE in Geotechnical Earthquake Engineering, and winner of the 2012 Shamsher Prakash Research Award.

Centre of Excellence in Centrifuge Modelling

Experiments are indispensable to gain insights, validate numerical models, and evaluate mitigation techniques. Expected to be operational in 2020, the Centre of Excellence in Centrifuge Modelling (Fig. 9a), the new facility includes a 9 m diameter beam centrifuge of 500gton capacity (Fig. 9b): 2ton payload at 250g. Centrifuge modelling can overcome the problem of scale-effects by scaling up gravity to recreate the same stress levels as in reality. The new centre offers a unique combination of capabilities, including: (a) *seismic shaking*, using an (Actidyn) centrifuge-mounted earthquake simulator, capable of shaking models of up to 700 kg at 100 g; (b) *faulting* and its effects on structures, using a custom-built (in-house) split-box; (c) *tsunami loading*, using an innovative (in-house) Centrifuge-mounted Miniaturized Tidal Generator (C-MTG); as well as (d) *monotonic & cyclic loading*.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

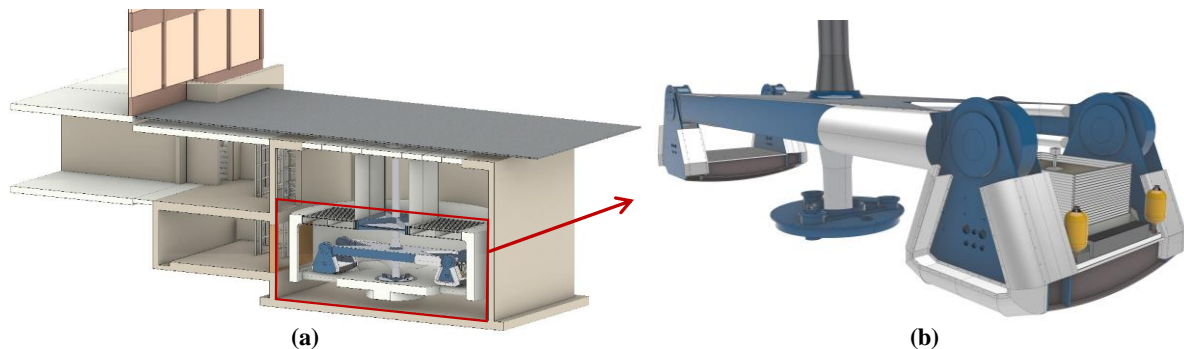


Figure 9. Centre of Excellence in Centrifuge Modelling: (a) new lab facilities; and (b) 500 g-ton beam centrifuge

Current research topics

1. Design of New and Retrofit of Existing Structures mobilizing Nonlinear Soil Response

It has been several decades since the realization of the earthquake engineering community that the increase of strength of a structural system does not necessarily enhance safety. This led to the development of new design principles and performance-based design. Less attention has been given to the soil-structure system as a whole. In fact, current design practice attempts to avoid full mobilization of foundation bearing capacity. However, neglecting such phenomena prohibits exploitation of strongly nonlinear energy dissipation mechanisms in defense of the superstructure.

Prof. Anastasopoulos and co-workers have been investigating the mechanisms governing seismic soil-structure interaction (SSI), with emphasis on the rocking response of shallow foundations. A new design philosophy termed “rocking isolation” has emerged, exploiting soil “failure” to protect the superstructure (Fig. 10a). By intentionally under-designing the foundation, this acts as a “fuse” and the plastic hinge is “invited” into the foundation soil. In this way, the soil yields progressively while the structure remains undamaged; the ductility capacity of the entire system is significantly increased. The price to pay is reflected in residual settlements (and rotations) that need to be accounted for in design.

Supported by the Swiss Federal Road Office, current research focuses on the retrofit of existing bridges on pilegroups (Fig. 10b). In Switzerland (and worldwide), the vast majority (over 90%) of existing bridges were built before the 90’s, without any or just “basic” seismic design. This renders seismic loading a critical element of retrofit design. Incomplete understanding of dynamic soil-structure interaction (SSI) often leads to over-conservative pilegroup design, prohibiting full mobilization of their capacity. Allowing strongly nonlinear pilegroup response may substantially reduce the required interventions, also offering the potential of *improved seismic performance*. This may allow optimization of retrofit design, taking advantage of the benefits of controlled nonlinear response.

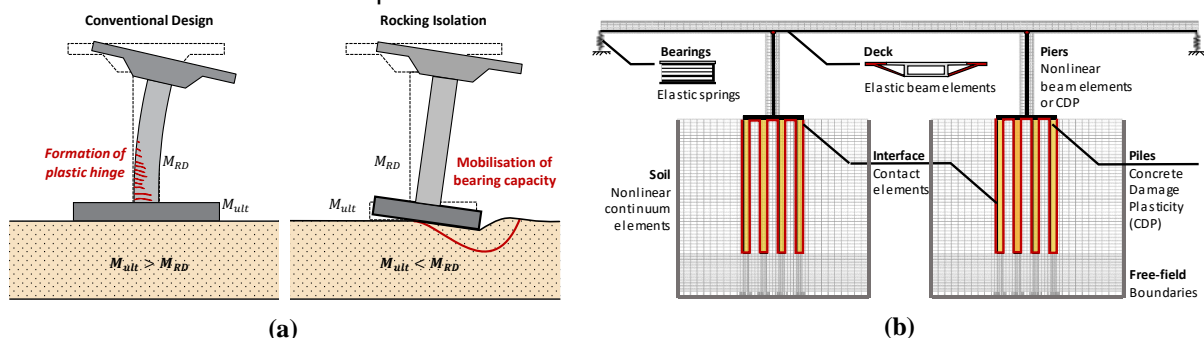


Figure 10. (a) conventional design vs. rocking isolation; and (b) model of bridge on pilegroups

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

2. Faulting and its effects on structures

Recent earthquakes, such as Kocaeli (Turkey 1999), Chi-Chi (Taiwan 1999), Wenchuan (China 2008), Kaikoura (NZ 2016) and Kumamoto (Japan 2016) have shown that faulting-induced deformation can cause substantial damage to infrastructure. Until recently, little field evidence was available on the interaction of foundations and structures with a surface fault rupture. Prof. Anastasopoulos and co-workers have been studying Fault Rupture-Soil-Foundation-Structure Interaction (FR-SFSI) employing an integrated approach, combining field studies, centrifuge model testing and numerical analyses, culminating to the development of a validated methodology for analysis and design of structures against faulting-induced ground deformation. These methods have been applied to a number of projects of significance (25 bridges, 8 tunnels, and several important buildings).

While substantial research has been devoted to new structures subjected to dip-slip faulting, almost no work has been done on *existing structures* subjected to *strike-slip* faulting, which is the focus of current research efforts. The aim is to understand the interaction mechanisms of strike-slip faults with shallow and deep foundations, as well as representative bridges and buildings, and develop simplified design methods. In addition to numerical analysis, centrifuge tests will be conducted as soon as the new centrifuge facility is operational, using a custom-built centrifuge-mounted split-container.

Innovative mitigation techniques are being developed, including sacrificial members and “smart” barriers. Their efficiency has been demonstrated for an idealized shallow foundation (Figs. 11a,b). A “smart” barrier is employed to divert the fault rupture, by introducing a minimum energy path. The “smart” barrier is composed of two sheet-pile walls, connected with rows of sacrificial members. The latter are steel rings, the performance of which is a function of geometry. The proposed system can be produced in the form of prefabricated panels (Fig. 11c). The barrier is compressed, absorbing tectonic deformation with minimum disturbance to the protected structure.

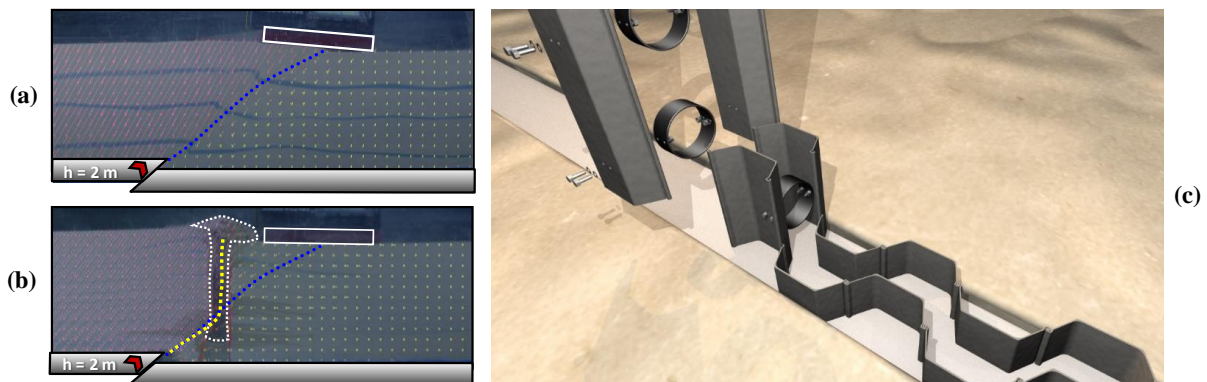


Figure 11. Experimental proof of concept: (a) no mitigation, compared to (b) mitigation with “smart” barrier; and (c) conceived prefabricated panel, assembled from sheet-pile walls and cylindrical sacrificial members.

3. Tsunami-loading of coastal infrastructure

Despite being rare in relative terms, Tsunamis are increasingly impactful to the built environment, due to the rapidly increasing population in coastal areas. Coastal infrastructure needs to remain at least partially operable after impact, allowing access to relief vessels, and decreasing the risk of “cascading effects”. The latter can magnify the impact of tsunamis, such as in the 2011 Tohoku earthquake and Tsunami, where failure of flood protection led to one of the most serious nuclear incidents in history. It is therefore crucial to improve understanding of the failure mechanisms of coastal infrastructure.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

After the 2011 Tohoku Earthquake and Tsunami, breakwaters were reported to be badly damaged. Worryingly, many of those were designed to be “Tsunami Resistant”. A standout such example is the Kamaichi breakwater (Fig. 12a), which was the biggest in the world (50 m height). Such failures reveal that the critical failure mechanisms are fundamentally different to those considered in design. Their failure is complex, being a combination of hydraulic and geotechnical failures, where one initial small failure can trigger the other: hydraulic scour at the base may trigger bearing or slope failure. The response of such systems is a function of effective stress changes (pore pressure build-up), and more crucially, geometry changes due to scour and erosion processes.

A Centrifuge-mounted Miniaturized Tidal Generator (C-MTG) is being developed, by adapting a recently completed 1g MTG concept (Fig. 12b). The system uses re-circulation pumps, allowing constant flow over the model space, vastly reducing the required volume of water stored in the main tank. Recirculation is facilitated by “pump” tanks, which can pump large volumes of water at low velocity, with minimal mechanical complexity. The pump-tanks function using air pressure and a system of check valves. Operating like a pair of bellows, in conjunction with the main tank they can produce Tsunami waves of any duration. As soon as the new beam centrifuge is operational, the C-MTG will be used to study critical failure mechanisms of coastal geotechnical structures, derive insights on the interplay between hydraulic and geotechnical failure mechanisms, and develop robust design procedures. After understanding the fundamental mechanisms, mitigation techniques will be tested.

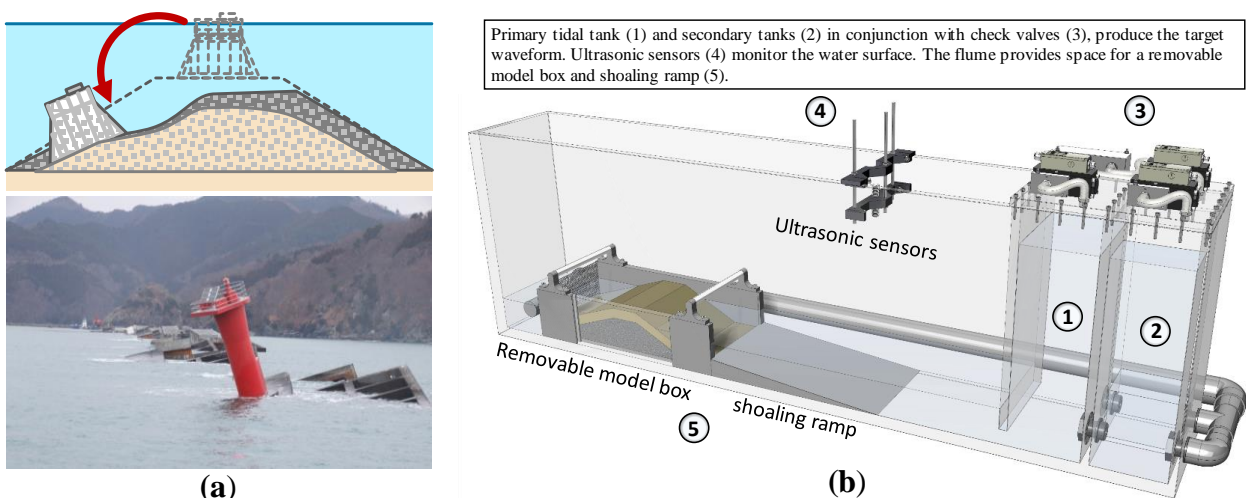


Figure 12. (a) The Kamaichi breakwater; and (b) Miniaturised Tidal Generator (MTG) and its main components.

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich



Dr. L. Michael Plötze

Group Leader of Geo-environmental Engineering and Clay Mineralogy
MSc and PhD in Mineralogy, TU Bergakademie Freiberg, Germany

Dr. Plötze's primary areas of research are in the characterization of fundamental properties of different kind of materials and minerals, especially clay minerals with respect to various applications in environmental geotechnics and materials science as well as the specific modification of the properties to the related application parameters.

Special topics of interest include:

- Interactions between geotechnical failures and environmental pollution and mitigation (geotechnical eco-hazards)
- Mineral-fluid reactions and transport processes in porous adsorbing media
- Effects of pore water chemistry and of chemical and physical alteration of clay minerals on macroscopic clay/soil properties
- (Clay) mineral - organic matter interaction
- Mineral alteration processes during weathering processes in the "Critical Zone" part. in cold environments
- Developments in quantitative analysis of clay minerals and mineral assemblages

Current research topics

1. (Clay) mineral - organic matter interaction

The research of the group faces such important questions: How, and to what extent, does mineralogy control the amount and composition of organic matter stabilized in soils and preserved in sediments? What are the adsorption mechanisms of organic matter on different (clay) mineral surfaces and what are the mechanisms through which (clay) minerals stabilize organic carbon in soils and sediments? How does organic matter affect contaminant uptake and dissolution from mineral surfaces (stabilization/degradation/fractionation)? How does organic matter and pollution affect the soil mechanical properties of (clay) soils?

In a joint project with Prof. Eglinton's Biogeoscience Group at the Geoscience Department the control of different minerals, in particular phyllosilicates, on the stabilization and preservation of natural organic matter in soils and sediments is assessed. The link between mineralogy and associated organic matter reveals that continentally-derived organic matter of pedogenic origin is stripped from smectite mineral surfaces upon discharge and dispersal to distal ocean settings.

2. Mineral-fluid reactions and effects of chemical and physical alteration of clay minerals

The influence of the pore water chemistry and other chemical and physical alteration on macroscopic clay/soil properties such as swelling, stress-strain behavior, and hydraulic conductivity is a well-known phenomenon. The question is, can we control mineral-fluid reactions e.g. in processes concerned with waste disposal? The research of the group focuses on investigations of coupled thermo-hydro-mechanical and chemical phenomena in clayey barrier systems part. in conditions in radioactive waste repository. In cooperation with Nagra (the Swiss National Cooperative for the Disposal of Radioactive Waste), the influence of physical factors like temperature gradients, pressure, and ionizing radiation on the crystal structure and properties of (clay) minerals but also of chemical factors (interaction with metal, cement, and rock) are investigated with regard to their impact on transport processes in porous adsorbing media to assess the functionality and stability of the engineered and geological barriers. Another field of research related to effects of pore water chemistry on clay/soil properties is the investigation of the influence but also the

Research highlights (Con't)

Institute for Geotechnical Engineering, ETH Zurich

targeted modification of properties like hydraulic conductivity, shear strength and swelling behavior, e.g. by salts, organic matter, and polymers.

3. *Weathering processes in the "Critical Zone"*

This research is aimed at the investigation of weathering processes especially in cold regions. In connection with retreating glaciers and thawing permafrost, numerous environmental geotechnical questions are of interest, such as rock and slope instabilities and erosion processes, but also the release of substances due to changes in the extreme environmental conditions. The group is focusing in its research on the investigation of hydromechanical and weathering processes in unstable zones in part. on structural properties of rocks and soils (e.g. porosity), on natural hazards risk assessment and mitigation (e.g. clogging of streams, release of free aluminum ions at low pH), and on field analysis of mineral transformation processes and mineral-microbe interactions.

4. *Developments in quantitative analysis of clay minerals and mineral assemblages*

The group maintains a research laboratory (ClayLab) with state-of-the-art instruments and techniques for determining fundamental parameters (mineralogy, chemistry, physical properties) of a wide range of materials. The main equipment in the laboratory are:

Powder X-ray diffractometer (mineralogy)

Thermogravimetry coupled with mass spectrometer

Elemental analyzer for carbon and sulfur

Particle sizer (laser scattering)

Pycnometer (true and bulk density)

Vane shear test device and rheometer

FT-IR spectrometer (mineralogy)

ICP-OES spectrometer (chemistry)

Photometer (chemistry)

Mercury intrusion porosimetry

Gas and water adsorption measurements

Thermal conductivity meter

The quantitative mineralogical analysis of (clayey) rocks and soils is of crucial importance for geoscience and geotechnical engineering as well as for industry but still a challenge. In order to ensure and improve the quality of the analyses, the participation in international round robin tests is for laboratory routine. The Reynold's Cup Competition from the Clay Minerals Society (CMS) is such a round robin open to anyone interested in quantitative mineral analysis, with particular emphasis on clay mineralogy. The IGT ClayLab has achieved top positions in the Reynolds Cup for 14 years. In 2012 the laboratory excelled with a 1st place. In 2018, as in 2004, it was able to secure 3rd place by winning against 57 laboratories from 25 countries (<http://clays.org/Reynolds.html>).

5. *Risk assessment and mitigation of geotechnical eco-hazards*

Geotechnical failures and environmental pollution are often interrelated, creating a special type of hazards: Geo-Eco-Hazards. In the past 10 years, the unique combination of expertise shared by Dr. Plötze's ClayLab and Prof. Puzrin's Chair allowed for successful investigation of challenging geo-eco-hazard problems in the USA, Mexico, Brazil, Italy and Israel, and for prevention of potential geotechnical failures leading to ecological catastrophes in Azerbaijan and Switzerland. This work has demonstrated that there is a clear need in a pro-active multidisciplinary approach for geo-eco-hazard assessment and mitigation by conducting fundamental research towards:

- Understanding effects of pollutants and organic matter on stability of soils and geotechnical structures;
- Development of novel approaches to risk assessment of geo-eco-hazards;
- Development of novel mitigation and (green) remediation techniques.

Included in this research topic is the development of new in situ microsensor technologies to explore applications for geo-environmental research and monitoring, e.g. using ground-buried FO sensors to analyze chemical parameters in the pore water and air of contaminated areas. Currently, the following Geo-Eco-Hazard case studies are investigated in collaboration with Prof. Puzrin's Chair

- Geotechnical aspects of the phosphogypsum stack stability
- Stability of tailing dams (collaboration with the University of Sao Paulo, Brazil)
- Mitigation of offshore pollution (collaboration with the Politecnico di Bari, Italy)

Report from Board-level committee

CAPG session at 17th ECSMGE, Reykjavik, Iceland

At the 17th ECSMGE, CAPGE of the ISSMGE held a session, on a topic: *“Bridging the gap between designers and constructors: how do we ensure effective ‘transfer’ of design into construction?”*.

The CAPG plenary session took place in the morning of the last day of the 4-day Conference. It was the first part of the morning session and the Bright Spark Award lectures succeeded the CAPG panel discussion. It was organised this way so that the Young Members Presidential Group (YMPG) can be exposed, connect and interact as much as possible with the Industry and the Corporate Associates (CA).

The CAPG panel discussion members were as below

- Yuli (Chaido) Doulala-Rigby, (Tensar, Corporate Associate) - Panel Chair
- Karel Allaert (Jan De Nul, Corporate Associate)
- Lars Anderson (NGI, Corporate Associate)
- Mandy Korff (Deltares, Corporate Associate)
- Jorgen Steenfelt (Cowi)
- Valérie Bernhardt (Terrasol) - Moderator
- Fabio Tradigo (Arup - Corporate Associate, YMPG) - support and Chair of Bright Spark Lecture



Photo 1. During the CAPG session

The CAPG panel discussion kicked off with an introduction by Peter Day that included what CAPG is, what is our aim, what have we achieved so far and where we are heading. Then Peter introduced the CAPG Panel Discussion Chair, Yuli (Chaido) Doulala-Rigby, who set the scene of the topic of the panel discussion by briefly presenting an anonymous near miss case study where the wrong fill was used in a project, despite appropriate fill being explicitly specified on the construction drawings and the what the consequences would have been if the situation was not rectified. Then Yuli introduced the panel discussion members and handed over to the moderator, Valérie Bernhardt, who asked both the panel and the audience to reply to the following 3 questions. A lively debate and floor participation followed with various views and opinions being expressed, some of them captured as below:

1. How can we ensure that the responsibility for supervision and compliance with specifications does not fall through the cracks?

- *Need for a geotechnical engineer on site. Not about paperwork but it is about looking closely to the site as that would raise early warnings and prevent problems to be overlooked.*
- *We need to have things in writing. Who is responsible from a contractual point of view to do what. The level of checks we have on site sometime is not the same we have in design activities.*
- *Put things on drawings, not just on large reports.*
- *Training engineers in university.*

Report from Board-level committee (Con't)

CAPG session at 17th ECSMGE, Reykjavik, Iceland

- *Many things written in the contract in France. We tried to add regulations to have supervision as mandatory to have a geotechnical engineer on site. Contractor has his mission and the owner needs a geotechnical engineer to supervise.*
- *In Austria the geotechnical designer is also the project site verifier. This seems to work quite well.*
- *Impractical to have geo engineer on site during full construction. You need a certified inspector who knows what is going on under the guidance of a geo engineer. Not necessarily a geo engineer. In USA you have quality engineers for the whole project. You do not need a full time geo engineer, as that is more applicable.*
- *Supervision is not the issue. Selection of a suitable contractor for the works is the issue. Specialist works require specialist contractor and owners should recognise this and ensure that suitably experienced people are involved in these works at the tender stage.*
- *Designers have no power over the selection of the Contractor and hence the quality. We need to improve understanding of design requirements on site how we can improve communication between contractors, owners and designers.*

2. How can we best equip site staff and young graduates to recognise potential critical departures from specification requirements?

- *In my experience new engineers had had to spend at least 5 years on site to build practical experience. This required, to some degree, unlearning the theoretical practice that they had been taught at University. They were able to understand the same concepts but from a practical point of view.*
- *It is not just the responsibility of young engineers. We are all required to constantly learn our trade. We can learn a lot from the presentations case studies not just from site based experience early in our career. Older engineers are probably better equipped to understand issues have occurred from case studies.*
- *We need more case study examples as a learning points for the industry as a whole. This helps us learn about the implications of departures from specifications.*
- *The bottom line is money. Universities have insufficient funding to allow site-based training. This needs to be borne by the industry. In my opinion this can only be obtained through postgraduate industry training (on the job).*
- *It's concerning to hear that funding may result in project manager's dictate the quality of a project outcome rather than technical people. Or that price is dictating the quality of contractors employed.*
- *Manufacturers have had to bridge the gap. We have had to become both the consultant and the contractor on projects to protect PI.*
- *I believe the issue is commercial arrangements and the way construction projects are divided up and sub-contracted on site. There needs to be more clarity about responsibilities between engineers and various subcontractors. Supervising engineers also need to be empowered to highlight deviations from specifications.*
- *I have no direct experience in civil construction however I can tell you that in France we encourage undergraduates to spend at least 10 months in the field as part of their academic training. This emphasises the fact that geoscience is field based and not office based. There is a risk that with the increase in numerical modelling and computer based design methods that less and less engineers are exposed to site based practical issues.*
- *Internships are important part of undergraduate study. In Sweden we encourage students to spend time within industry to gain this practical experience.*
- *Modern construction practice and health and safety requirements are hindering engineers exposure to practical construction problems. For example, visiting sites requires full inductions and there are often exclusion zones around heavy equipment e.g piling rigs.*
- *Accountability is an issue; individuals are singled out for problems on site and not companies. Programming and late communication often prevents the flow of design requirements to site.*

Report from Board-level committee (Con't)

CAPG session at 17th ECSMGE, Reykjavik, Iceland

- *Construction works are often started ahead of specifications being finalised or adequately relayed to site base staff.*
- *It's not just young engineers, I believe all professionals need assertiveness training or at least be supported and empowered to speak up and question when they believe site work deviates from that intended by the design.*

3. How can our Industry balance technical excellence vs. commercial interests?

- *In my opinion the role of technical people within companies and organisations and their relative importance when compared to the business leaders and Line management elements has diminished over time. This imbalance in importance is leading to less of project funding being allocated to site based technical staff and more to office based managerial staff.*
- *Which is a shame because geotechnical engineers are ultimately much more cheaper than lawyers.*
- *Less supervision increases the risk of deviation from specifications. Less supervision implies that the design is more robust to omissions and less quality works*
- *I agree less money is spent on supervision then the commercial management of projects. Commercial tension between tendering contractors are resulting in efficiency in supervision being employed more and more. Less specialist attendance results.*
- *Should a technical excellence be considered in the commercial aspects of a project when we consider the technical excellence of designers or contractors.*
- *Could we account for less experience in a more robust design which may cost more. Should we be considering a factor of safety on our design in relation to the experience of the designer or the class of contractor that we envisage will undertake the work!!*

The CAPG panel discussion session concluded with an interactive survey where we asked all delegates to log on a website with a passcode that was displayed on the screen and asked them to respond to 5 questions that had multiple choice replies. As the delegates from the floor were responding to the questions, the results were displayed on real time on the screen for all to see! That was a very successful interactive session and got most of the audience engaged, with more than 200 participants that replied to all or most of the 5 questions set out in the table below.



Photo 2. Delegates actively participating the CAPG session

Report from Board-level committee (Con't)

CAPG session at 17th ECSMGE, Reykjavik, Iceland

<p>What description fits you best?</p> <ul style="list-style-type: none"> • Supplier • Academic • Designer • Other <p>How big is the gap between academia and practice?</p> <ul style="list-style-type: none"> • Practitioners, who are they? • Gap exists, is too big! • Never saw an academic after I graduated! • There is no gap <p>Who should be principally responsible for geotechnical site supervision?</p> <ul style="list-style-type: none"> • Designer • Contractor • Asset Owner • Resident Engineer <p>Who should be responsible for training young site supervisors?</p> <ul style="list-style-type: none"> • On the job • University • Prof. or voluntary associations like ISSMGE etc <p>What is your suggestion to bridge the gap between academia and practice?</p>

The CAPG panels discussion concluded at this point and Yuli introduced the Chair of the Young Member Presidential Group (YMPG) Session, Fabio to introduce the Bright Spark Award lectures session.

Europe Bright Spark Awards

Fabio Tradigo summarized YMPG activities and summarised the purpose and the process of the Bright Spark Award, which is a new award promoted by ISSMGE to promote young members of ISSMGE to play a major role in various international and regional conferences. The award consists in the opportunity for promising young (under 36 years old) geotechnical engineers/academics to have a chance to deliver keynote and invited lectures at these conferences.

Most of the European member societies nominated candidates for this ECSMGE 2019 Bright Spark Award, YMPG provided a preliminary selection to ISSMGE President for final approval. More details and future calls can be found on the ISSMGE website.

Fabio introduced the two winners: Federico Pisanò and Matteo Ciantia. A brief summary of their CV and keynote is summarized below.

Federico Pisanò - *Input of advanced geotechnical modelling to the design of offshore wind turbine foundations*. Federico is Assistant Professor at TU Delft. He received his Ph.D. from Politecnico di Milano, and carried out international research at UPM (Spain), UC Davis (USA) and UWA (Australia). He is member of TC209 on Offshore Geotechnics, and recently chaired the CPT'18 conference in Delft. His main research interests, testified by over 50 publications, lie on the numerical modelling of soil behaviour and soil-structure interaction, with emphasis on offshore geotechnical applications.

His lecture overviewed recent work at TU Delft regarding advanced numerical modelling in offshore wind geotechnics. The benefits of 3D FE modelling combined with sophisticated constitutive models are demonstrated with respect to the structural analysis of offshore wind turbines and their monopile foundations subjected to environmental cyclic/dynamic loading.

Report from Board-level committee (Con't)

CAPG session at 17th ECSMGE, Reykjavik, Iceland

Matteo Ciantia - *Pile penetration in crushable soils: Insights from micromechanical modelling*. Matteo is Lecturer at the University of Dundee, with background in theoretical and numerical geomechanics. Prior to his current post he was at Imperial College London as a junior research fellow and at UPC as a postdoctoral researcher. Since his PhD awarded at the Politecnico di Milano in 2013, Matteo has published 55 original research articles in leading international journals and peer-reviewed conferences.

Matteo presented his work on discrete element modelling of piles in crushable media. He showed how the DEM can be employed to study such a complex mechanical problem. The results unveil interesting micromechanical mechanisms that may help to understand the macroscopic response of these structures.

Fabio and Prof. Manassero (Europe VP) closed the session.

Yuli (Chaido) Doulala-Rigby, (Tensar, Corporate Associate) - Panel Chair

Fabio Tradigo (Arup - Corporate Associate, YMPG) - support and Chair of Bright Spark lecture

Conference reports

The 13th Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNCMGE), Tianjin, China

The Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNCMGE) is held every four years and has become the premier event on the soil mechanics and geotechnical engineering in China. The 13th CNCMGE held in Tianjin, China, on 18 - 21 July 2019, was hosted by the Chinese Institution for Soil Mechanics and Geotechnical Engineering (CISMGE) and organized by Tianjin University (see Photo 1), the Tianjin Civil Engineering Society, the Technical Committee of Soil Mechanics and the Underground Engineering of the Architectural Society of Tianjin. Tianjin University, founded in 1895 as Peiyang University, is the first modern institution of higher education in of China. Tianjin University's 123-year history is the epitome of the progress of modern Chinese higher education, embodying the Chinese people's indomitability through challenging times. During its growth spanning three centuries, the University has been a pioneer in several fields, from the first aero engine in China to the first Hydraulics Laboratory established in China.



Photo 1. Tianjin university

The 13th CNCMGE with the main theme of “Quality Improvement and Sustainability Development of Geotechnical Engineering” provided a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of soil mechanics and geotechnical engineering.

The conference organizing committee chair, Prof. Gang ZHENG from Tianjin University who is also the vice president of the CISMGE and chair of TC219 “System Performance”, ISSMGE, gave speech to warm welcome all the attendees on the opening ceremony. Prof. Charles W.W. NG, the President of ISSMGE, and Prof. Jianmin ZHANG (see Photo 2), the President of CISMGE, gave their speeches at the Opening Ceremony of the conference after the address made by Prof. ZHENG (refer to Photo 3). In addition, Prof. Charles NG presented ISSMGE souvenirs (two ties and a scarf) to Prof. Jianmin ZHANG, Prof. Gang ZHENG, Prof. Jianhong ZHANG and Secretary General of CISMGE, respectively, for their significant contributions to the Soil Mechanics and Geotechnical Engineering in China. (refer to Photo 4).

Conference reports

The 13th Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNCSMGE), Tianjin, China (Con't)



Photo 2. The President of CISMGE, Prof. Jianmin ZHANG, gave his speech to warm welcome all the attendees on the opening ceremony



Photo 3. The conference organizing committee chair, Prof. Gang ZHENG, gave his speech to warm welcome all the attendees on the opening ceremony

Conference reports

The 13th Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNCSMGE), Tianjin, China (Con't)



Photo 4. Presentation ceremony of souvenirs (ISSMGE ties and scarf) by the president of ISSMGE, Prof. Charles NG, to Profs Jianmin ZHANG and Gang ZHENG on his left and a scarf to Prof. Jianhong ZHANG on his right at the opening ceremony of the conference

More than 2,500 leading academic scientists, researchers and engineers, including 10 academicians of the Chinese Academy of Engineering, have attended the conference to exchange and share their experiences and research results on all aspects of soil mechanics and geotechnical engineering. The conference consisted of 8 keynote lectures and 8 invited special lectures (see Table 1 for details). Moreover, other exciting events were organized including an International Symposium on Global Innovative Issues of Geotechnical Engineering, the Academician leading Scientist Symposium, the MAO Yisheng Geotechnical Symposium and a New Technology and Construction Equipment Forum, Symposium for Young Scholars in Geotechnical Engineering, and the Academic Oral Presentation Contests for Master and PhD students. For the International Symposium on Global Innovative Issues of Geotechnical Engineering, the organizing Committee has invited four internationally-renowned experts to deliver invited lectures regarding the safety and the performance of geotechnical and underground engineering (see Photo 5).

Table 1 List of keynote lectures and invited special lectures

Topic	Lecture type	Speaker
Theory of unsaturated soil state and its application in the field of ecology and energy	Invited special lecture	Charles W. W. Ng
Resilient geo-structural system: Basic concepts, design approaches and prospective applications	Invited special lecture	Gang Zheng
Review of microbial soil reinforcement technology	Invited special lecture	Hanlong Liu
Future underground engineering and digital, transparent and intelligent services	Invited special lecture	Hehua Zhu
Earth sensing: Distributed optical fiber sensing technology and its application in Geotechnical Engineering monitoring	Invited special lecture	Bin Shi

Conference reports

The 13th Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNCSMGE), Tianjin, China (Con't)

Topic	Lecture type	Speaker
Frontier scientific problems of deep sea soil mechanics and engineering	Invited special lecture	Fuping Gao
Special Geotechnical Engineering problems of Sichuan-Tibet Railway	Invited special lecture	Yangsheng Ye
New construction technology and engineering application of deep pile and diaphragm wall foundation	Invited special lecture	Yaoliang Li
A critical review on the research of fundamental behavior and constitutive relationship of the soil	Keynote lecture	Ga Zhang
Review of the geotechnical testing and exploration techniques	Keynote lecture	Zhengyin Cai
Review of ground improvement technology in China	Keynote lecture	Songyu Liu
Review of foundation engineering technology	Keynote lecture	Wensheng Gao
Deep excavation engineering and underground engineering: New techniques of high-efficiency and energy-saving, low environmental impact, and sustainable development	Keynote lecture	Weidong Wang
Soil dynamic and geotechnical earthquake engineering	Keynote lecture	Maosong Huang
Environmental geotechnics: state-of-the-art of theory, testing and application	Keynote lecture	Qiang Xue
Review of special soil and rock slope engineering	Keynote lecture	Yongli Xie
Using field performance monitoring to help manage risk to infrastructure	Invited lecture of International Symposium	W. A. Marr
Numerical analysis of stability and risk in highly variable soils	Invited lecture of International Symposium	D. V. Griffiths
Improving geotechnical practice and sustainability through innovations	Invited lecture of International Symposium	Jie Han
Making use of a generic geotechnical database for site-specific purposes	Invited lecture of International Symposium	Jianye Ching



Photo 5. Keynote speakers for the International Symposium on Global Innovative Issues of Geotechnical Engineering

Conference reports

The 13th Chinese National Conference on Soil Mechanics and Geotechnical Engineering (CNC SMGE), Tianjin, China (Con't)

The 10th Board of Directors of CISMGE held its first meeting during the conference (see Photo 6) and granted the next conference to be hold in Wuhan, China, 2023 and assigned Prof. Qiang XUE of the Chinese Academy of Sciences to be the Chairman of Organizing Committee.

The conference committee chair represented the attendees to announce the 2019 Tianjin Consensuses: the future prospects of Geotechnical Engineering in China should have the quality of Resilience, Green, Intelligence and Humanism. Geotechnical engineers have to take the responsibility to continuously pursuit the quality improvement, insist on innovation and sustainability development of the geotechnical structures.



Photo 6. Over 60 Board of Directors of CISMGE attending its meeting with Prof. Charles W.W. NG, president of ISSMGE (in the middle) also attended it as an observer

Conference reports (Con't)

SiDRR conference, Beijing, China

On May 11-12, 2019, Beijing, China, International Conference on Silk-roads Disaster Risk Reduction and Sustainable Development (SiDRR) was co-hosted by the Chinese Academy of Sciences (CAS), the China Association for Science and Technology(CAST), the United Nations Environment Program (UNEP), the UN Office for Disaster Risk Reduction (UNDRR) and the Alliance of International Science Organizations (ANSO), a group created to connect the scientific communities of Belt and Road Initiative (BRI) participants.

Climate change and disastrous geological activity, which include rapid tectonic uplift, and various natural hazards threaten both the social development and livelihoods along the Silk Road. In response to this, the theme of the SiDRR Conference 2019 is “Towards Safe, Green, and Resilient Silk Road”. Centered on this theme, more than 20 sessions focusing on various topics have been organized by several international academic organizations and societies. Scientists from China and other countries involved in the Belt and Road Initiative (BRI) will work together to enhance scientific and technological cooperation in disaster prevention and mitigation, according to a joint declaration, the Beijing Declaration, after the SiDRR conference.

More than 700 scientists from around 40 countries, regions and international organizations supported the declaration. It recommended actions including data-sharing, investing in disaster risk reduction technologies and infrastructure, and jointly enhancing disaster preparedness and response protocols.

Prof. Charles W. W. NG, President of International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), Chair Professor and Associate Vice President at Hong Kong University of Science and Technology (HKUST), was invited as a plenary keynote speaker in the afternoon session of Room 3A entitled “Theories and mechanisms of sustainable and ecologically engineered slopes”.

As key support organizations of the SiDRR conference, Tsinghua University and ISSMGE make a great support to the academic conference. Prof. Charles W. W. NG also served as the Chair of the parallel Session 1 - The Formation Process, Mechanism, and Treating Countermeasures of Landslides, which was well organized by Tsinghua University and ISSMGE. Dr. Yifei Cui from Tsinghua University served as the secretary and host of the session. Prof. Luciano PICARELLI from Università della Campania “Luigi Vanvitelli”, Italy, and Prof. Núria PINYOL from Universitat Politècnica de Catalunya (UPC, Spain) were invited as a lecture speakers in Session 1. There are also 9 oral presentations in session 1 following the invited lectures. More details available in www.sidrr.com.



Photo 1. Opening ceremony.

Conference reports (Con't)
SiDRR conference, Beijing, China (Con't)



Photo 2. Keynote addressed by Prof. Charles NG



Photo 3. Group photo of Session 1.



Photo 4. Invited speech by Prof. Luciano PICARELLI



Figure 5. Invited speech by Prof. Núria PINYOL



Photo 6. Discussion session for Special Lecture



Prof. Yifei Cui
Department of Hydraulic Engineering, Tsinghua University

ISSMGE Foundation reports

ECSMGE-2019 was an important gathering of researchers and experts supported by ISSMGE in Soil Mechanics and Geotechnical Engineering from all around the world. According to the conference website, the conference committee received 915 papers from 58 countries. There were 5 keynote lecturers delivered by Profs Suzanne Lacasse, Sigurour Erlingsson, Antonio Gens, Jorge Zornberg and Lyesse Laloui from top-tiered universities and institutes presenting various topics such as dams and risk assessment recent developments and applications, geotechnical challenges in Iceland, hydraulic fills with special focus on liquefaction, stabilization of roadways using geosynthetics and energy geotechnology. There were also seven workshops supported by ISSMGE focusing on safety and serviceability (TC205), transportation (TC202), physical modelling (TC104), dykes and levees (TC201), slope stability (TC208), dams and embankments (TC210) and numerical methods (ERTC7). The oral presentation sessions included mechanics of soils related to time, temperature and chemistry, numerical methods, in-situ testing, ground improvement, megacities, engineering practice of risk, geo mechanics, ground improvement and anthropic soils, numerical methods, underground construction, unsaturated soils, reinforced fill structures, laboratory testing, transportation geotechnics, environmental geotechnics, offshore geotechnics, preservation of historic sites, sustainability, deep foundations, dams and embankments, earthquake, energy geotechnics, piles-in-situ testing and numerical methods, slope stability, soil-structure, dykes and levees, physical modelling, safety and serviceability and soft soils. The conference program shows that ECSMGE-2019 was one of the most comprehensive geotechnical engineering conferences.

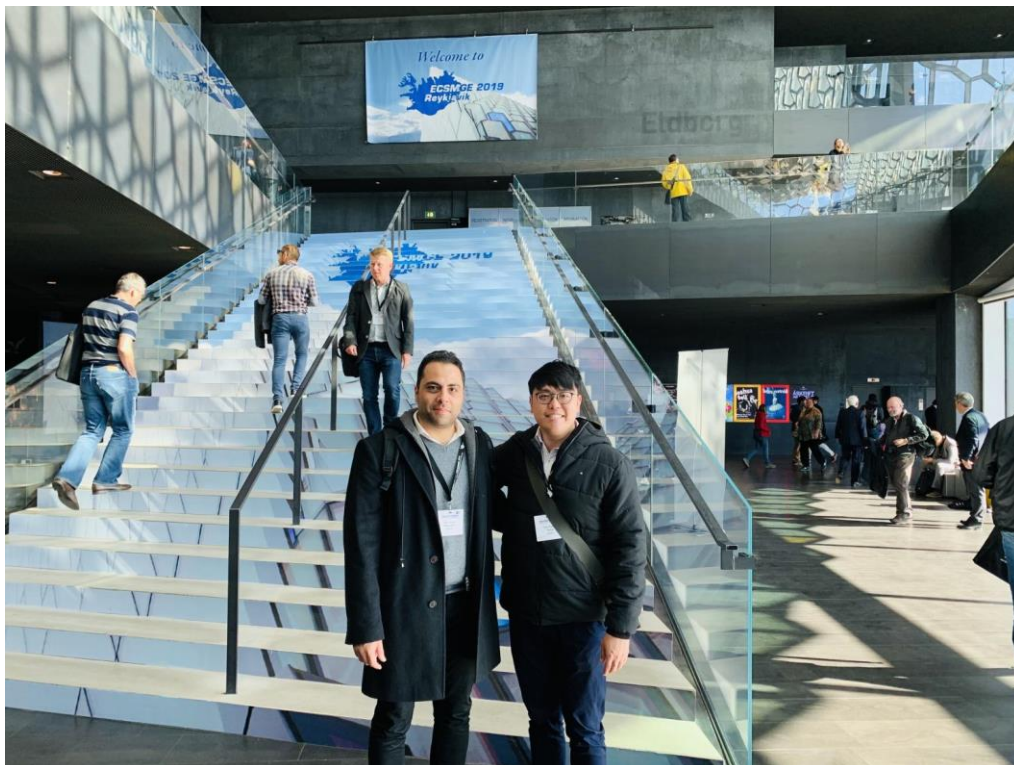


Photo 1. With my colleague Philip Tsang making ourselves ready for our presentations

*Dr Amirhassan Mehdizadeh
The University of Melbourne*

ISSMGE Foundation reports (Con't)

The XVII European Conference on Soil Mechanics and Geotechnical Engineering was held in Reykjavik, Iceland between 1st and 6th of September 2019 in the Harpa conference hall. This conference is the most important in Europe for geotechnical engineers and its prestige was also raised by the architecture masterpiece of Harpa. The conference started with the meetings of technical committees, which was followed by a get together event, providing a nice opportunity to have a light chat with new and long-time-no-see colleagues. The conference was opened the next day by honoured guests such as the former president of Iceland and the president of ISSMGE, Prof. Charles Ng. The following three days comprised keynote lectures and invited plenary papers in the morning, and technical discussions and parallel sessions in the afternoon. During the day the attendants could also visit the exhibited posters. Coffee and lunch breaks between the sessions provided good opportunities to exchange ideas with colleagues and discuss the presentations. The closing ceremony took place on Thursday afternoon, during which the attendants were invited to forthcoming conferences, including the next ECSMGE in Lisbon. The last day was a perfect closure for the conference as this included various technical tours to destinations including one of the largest ice tunnels in Europe, a geothermal power plant or to the open sea to observe whales.

I also would like to thank the generous support of ISSMGE foundation, which allowed me to visit this absolutely stunning country and attend the most prestigious geotechnical conference in Europe.



Photo 1. Hungarian delegates of the conference

Zoltán Bán
Budapest University of Technology and Economics

ISSMGE Foundation reports (Con't)

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. Young geotechnical engineers have a chance to deliver a keynote and publish an associated paper. The 5th of September 2019 I had the honour to receive this award and present my work at the European Conference on Soil Mechanics and Geotechnical Engineering in Reykjavik. As each national geotechnical association member of the ISSMGE nominates one or two candidates to the young members presidential group (YMPG) of the ISSMGE (which then come up with up the winner), I am really thankful to the BGA for having supported me. Thursday morning in front of hundreds of delegates, in the main hall of the beautiful *Harpa Conference Centre* in the Icelandic capital, I delivered my first Keynote ever which was entitled “Pile penetration in crushable soils: Insights from micromechanical modelling” (Figure 1). The goal of my presentation was to convince the audience that the discrete element method (DEM) is a numerical tool that can be successfully used to investigate complex geotechnical problems. I showed how the particle-scale mechanics that underlie the observed macroscopic responses affects distributions of particle stresses and forces around the shaft. The paper associated with the Bright Spark Lecture is open access and provides insights into one of the mechanisms proposed for the well-known, yet not fully understood, marked shaft capacity increases developed over time by piles driven in sands.

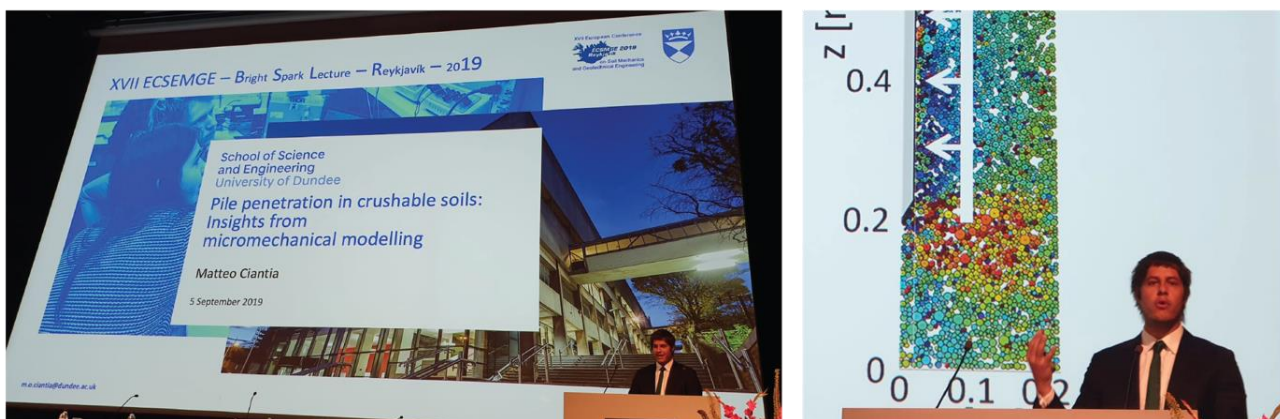


Photo 1. A couple of photographs of me delivering the Bright Spark Lecture.

On top of delivering my first (hopefully not the last) Keynote presentation, during the conference I also presented my work on critical state in crushable soils. Unfortunately, I was not able to get a decent picture of myself while presenting. On the other hand, I attended the conference excursion trip on the Friday morning where we entered into the Langjökull (Long Glacier) glacier.

Matteo Oryem Ciantia
University of Dundee

ISSMGE Foundation reports (Con't)

The first Mediterranean Young Geotechnical Engineers Conference was held in Bodrum, Mugla, Turkey, and I had a chance to get an ISSMGE grant to attend it. I had submitted two presentations which were accepted.

The first one was about an improvement of a limit-equilibrium software developed by IFSTTAR in the 80's for the design of soil-nailed walls. These kind of software are generally bad at predicted the facing loads profile and the improvement I presented tackles this problem. After my presentation, I received some questions during the session and numerous other questions during the coffee break. Some of the attendants have expressed their will to collaborate when my version of the software comes out on Open Access. The second presentation was about to tackle the determination of soil-nail interface parameters through pull-out tests. Even if it did not raise the same level of enthusiasm, attendants made some comments that will help the improvement of the method.

On top of that, this conference was the occasion of rewarding meeting with young geotechnical engineers from across the Mediterranean region. We talked about the cultural aspects of our differences and similarities as well as the technical ones. A point who stroke me was the different approaches people had on the subject of physical modelling. The similarities that we try to keep between the model and the prototype are not always the same and the scaling rules diverge. On the other hand, the rules to design geotechnical buildings seems relatively coherent between us.

Last but not least, this conference provided me an opportunity to exchange with Prof. George Gazetas about the seismic behaviour of soil-nailed walls, a subject that I try to study. His expertise in the seismic field helped me to understand some aspects of the problem from a point of view I never had before.

To sum up, despite my throat infection, this conference provided me an important help in the development of my works.

Jean de Sauvage
IFSTTAR, France

Hot news

Winter School: From research to practice in geotechnical engineering, Switzerland



Winter School:

From research to practice in geotechnical engineering

12 - 17 January 2020

[Congressi Stefano Franscini, Monte Verità, Ascona, Switzerland](#)

Program and Scope:

With the ultimate goal of developing innovative mitigation techniques, the international geotechnical engineering community has made substantial efforts to gain deeper insights on geotechnical hazards. For the state of practice to advance, academics need to join forces with practitioners. The Winter School aims to bring these two groups together, to question the status quo, and to propose out-of-the-box solutions.

The program includes:

- Keynote lectures by international experts from the academia and the industry;
- Seminars on state-of-the-art numerical and physical modelling techniques;
- Presentations by the participants;
- Panel sessions, where the participants will have a “debate” with industry and academia experts on the applicability of their ideas; and
- Special session on start-ups, on the process of product development, from initial conception to founding of a new company.



It is envisaged that this novel setup will not only expose the participants to different points-of-view, but will also allow cross-fertilization of ideas between the academia and the industry. Industry experts will have an opportunity to gain an overview of the latest developments, but also to contribute in shaping these ideas so that innovations can have a better chance of finding their way to practise. The Special session on start-ups aims to further emphasize the path from innovation to application. The participants will benefit from this chance to learn from, and challenge, senior researchers and industry experts, interact with each other, engage in critical thinking and to build international networks.

Registration

The Winter School is open to PhD students and research associates who have a solid background in soil mechanics/geotechnical engineering. More senior researchers and geotechnical engineers are also welcome. More information on registration and accommodation:

<https://geotechnics.ethz.ch/ws2020/registration.html>

If you have any additional questions, please do not hesitate to contact us at ws2020@igt.baug.ethz.ch.

Obituary

Prof. Sherif Wissa Agaiby (1962 – 2019)

Sherif Wissa Agaiby 1962-2019



After a brief but valiant fight with cancer, Prof. Sherif Wissa Agaiby passed away gracefully in London on the 20th of August 2019 at age 57. He was at peace, surrounded by his loved ones: Amani, his loving devoted wife of 33 years and his children Shehab and Shireen. He is dearly missed every day by his parents Wissa and Faiza, his sister Samar, her husband Sherif, his nieces Noor and Farah, his extended family and close friends.

Growing up in Egypt and Bahrain, Sherif was a unique, outstanding and well-rounded young man, always hungry for knowledge in all fields, a hunger satisfied through his avid reading habits, while at the same time loving life and enjoying sports including tennis, squash and cricket. He culminated his High School education with the highest honours, achieving the highest overall grades for his year in Bahrain. Dr. Agaiby continued to excel and graduated with highest honours from Cairo University, Egypt, earning his BSc and MSc degrees in Civil Engineering in 1983 and 1987, respectively. He subsequently moved to Cornell University, Ithaca, New York, to study for a Ph.D., which he was awarded in 1991. After completing his doctoral studies in the US, he returned to Cairo University where he was heavily involved in teaching and research for more than 20 years, rising through the ranks to a full professorship. During this period (1983-2004), Dr. Agaiby taught and conducted research in most fields of Geotechnical Engineering and supervised many research students who now hold leading positions in industry and academia worldwide.

Since joining Dar Al-Handasah Consultants (Shair and Partners) in 1991, initially on a part-time basis alongside his university post, shifting in 2004 to a full-time appointment, he has accumulated substantial practical engineering experience spanning nearly three decades. In 2004, he was appointed Director of Geotechnical and Heavy Civil Engineering Department and was responsible for high scale geotechnical, marine and pavement projects in the Middle East, Gulf region and Africa. He has played a leading role in delivering some of the largest and most notable civil engineering projects, overseeing the planning, analysis, design, and construction follow-up. In 2012, Dr. Agaiby enrolled in the Oxford Strategic Leadership Programme at Said Business School of Oxford University to harness his leadership qualities and capabilities. His outstanding academic background enabled him to apply state-of-the-art research in order to find innovative and creative solutions to complex practical engineering problems. He was also very generous with disseminating his knowledge and experience and was a highly-respected mentor to a large number of young and mid-career practicing engineers over the years.

Apart from his consulting and academic work, Dr. Agaiby was involved in many national and international scientific activities, including Chair of the Professional Image Committee of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE); Board Member of the Council of Foundation for Education and Training on Tunneling and Underground Space Use (ITA-CET); member of the Egyptian Code of Practice committees on Geotechnical Engineering and Foundations on Rock as well as on Site Investigation and the Design and Construction of Tunnels and Underground Structures. He was also on the editorial board of the Journal of Environmental Geotechnics and Geotechnical Engineering of the Institution of Civil

Obituary

Prof. Sherif Wissa Agaiby (1962 – 2019) (Con't)

Engineers (UK); editorial board member of the ISSMGE International Journal of Geoenvironmental Case Histories; and board member of the International Road Federation (IRF); member of Chi Epsilon, National Civil Engineering Honor Society (USA).

Dr. Agaiby was more than just an acclaimed engineer and academic with immense and wide-ranging contributions to engineering practice and research. He was also very active in societal and philanthropic work, largely through his involvement in the Rotary Club in Egypt and the Middle East for many years during which he was president of the Rotary Club of Giza Metropolitan, recognized as a Paul Harris fellow, was Inter Country Committee (ICC) National Coordinator for Egypt and chaired several key committees subsequently. He had a magical way of making every person who knew him feel special, no matter how young or old, how rich or poor, and always worked in silence to help everyone in need.

Despite his professional gravitas, Dr. Agaiby was a fun-loving man - passionate about fishing, he set several new records on fishing trips in the Mediterranean and overseas. He was an avid philatelist, he enjoyed exploring different cultures, especially trying exotic cuisines as a member of Chaîne des Rôtisseurs; visiting museums; attending musicals. He was a voracious reader and read about virtually everything.

Whilst his contributions to engineering will endure for many years to come, Dr. Agaiby would have liked to say his true legacy is the loving family he shepherded. He had a gift for keeping his family close-knit by using celebrations and vacations as a guide to unite them. To the many that he inspired, Dr. Agaiby will always be remembered as a force for good, a warm and altruistic friend, a positive and supportive leader, a generous man and a truly outstanding global citizen. A gentleman in the truest sense of the word, he lives on in the fond memories of all those he touched.

Obituary (Con't)

Prof. Gert den Hoedt (1935 – 2019)

In memory of Gert den Hoedt (1935-2019)

Only few weeks ago I was informed that Gert den Hoedt passed away on 8 March 2019 in Velp (the Netherlands).

Gert was a fine researcher on the use of geosynthetics for soil reinforcement in the AKZO Group: he was the author of several fundamental papers on the subject.

Moreover, Gert was a very active member of CEN TC 189 on Geosynthetics since its foundation in November 1989 in Brussels: he was an expert in WG 3 (Mechanical tests) from 1990 to 1996 and he was the Project Leader of the standard on Tensile Creep, EN ISO 13431, very much used in the design and practice of soil reinforcement structures.



In particular, from 1997 to 2000 he was Chairman of CEN TC 189 and in this capacity he led the plenary sessions in Goteborg (June 1997), Torino (November 1997), Nuremberg (December 1998), Brussels (June 1999), Paris (December 1999), Helsinki (June 2000) and Milano (October 2000).

Gert was also member of ISSMGE and one of the pioneers of the International Geosynthetics Society (IGS): he received in 1994 the IGS Honorary Membership for his full dedication to the organization of the 4ICG (4th International Conference on Geosynthetics in Den Haag in May 1990) and of the 5ICG (5th International Conference on Geosynthetics in Singapore in September 1994).

Most important, he was a very nice person: he had a great family with his wife Alice, daughters Ellen and Stella, and son Kim, and all the relatives.

He was able to establish a unique relationship with the entire group of geotechnical engineering and geosynthetics experts, both nationally and internationally.

Personally, I like to remember him as a real friend: in his memory, I enclose the photo taken during his after-dinner speech in occasion of the last CEN TC 189 meeting that he chaired in Italy in October 2000. Thanks Gert: your example and your precious contribution to the overall geotechnical community will remain for ever!

Daniele Cazzuffi
ISSMGE Bulletin Editor for Europe
IGS Past President and Chairman of CEN/TC 189

Event Diary

ISSMGE EVENTS

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

2019

GEOMEAST 2019 International Congress and Exhibition

Location: Cairo Marriott Hotel, Zamalek, in front of the Great Nile, Corniche El-Nile, Egypt

Dates: 10-11-2019 - 14-11-2019

Language: English

Contact person: Amany El-Masry

Address: Nasr City

Phone: +201151885508

Email: info@geomeast2019.org; info@ssige.org

Website: <https://geomeast.org/>

XVI Panamerican Conference on Soil Mechanics and Geotechnical Engineering

Date: 18-11-2019 - 22-11-2019

Location: Cancun, Quintana Roo, Mexico

Organizer: SMIG

Phone: +(52) 1 55 5677-3730, +(52) 1 55 5679 3676

E-mail: support@panamerican2019mexico.com

Website: <http://panamerican2019mexico.com>

The 4th International Conference on Geotechnics for Sustainable Infrastructure Development

Location: National Convention Center (NCC), Hanoi, Vietnam,

Date: 28-11-2019 - 29-11-2019

Language: English

Organiser: Vietnamese Society for Soil Mechanics and Geotechnical Engineering (VSSMGE), FECON Corporation, Thuyloi University (TLU), and Kokusai Kogyo Co., Ltd (KKC, Japan)

Contact person: NGUYEN Tien Dung

Address: FECON, 15th Floor, CEO Tower, HH2-1 Lot, Me Tri Ha Urban Area, Pham Hung Street, Me Tri Ward, Nam Tu Liem District

Phone: +84 903 440 978

Email: secretariat@geotechn.vn

Website: <https://geotechn.vn/>

9th Asian Young Geotechnical Engineers Conference

Location: University of Engineering & Technology (UET) Lahore, Pakistan

Date: 05-12-2019 - 07-12-2019

Language: English

Organiser: Pakistan Geotechnical Engineering Society (PGES)

Contact person: Dr. Muhammad Irfan

Address: 54810 G.T. Road

Phone: +92 306 66 666 010

Email: 9AYGEC@uet.edu.pk;

Website: <http://15icge-9aygec.uet.edu.pk/>

Event Diary (Con't)

15th International Conference on Geotechnical Engineering, and 9th Asian Young Geotechnical Engineers Conference

Location: Lahore, Pakistan,

Date: 05-12-2019 - 07-12-2019

Language: English

Organiser: Pakistan Geotechnical Engineering Society (PGES)

Contact person: Dr. Muhammad Irfan (for 15ICGE); Dr. Jahanzaib Israr (for 9AYGEC)

Address: Civil Engineering Department, UET Lahore, Pakistan

Phone: +92 306 66 666 010; +92 334 413 2808

Email: 15icge@uet.edu.pk , 9aygec@uet.edu.pk

First Indian Symposium on Offshore Geotechnics

Date: 05-12-2019 - 06-12-2019

Location: School of Infrastructure, Khordha, India

Language: English

Organizer: Indian Institute of Technology Bhubaneswar and Institute of Engineering and Ocean Technology,

Contact person: Sumanta Haldar and Shantanu Patra

Address: School of Infrastructure

Email: isog2019@gmail.com

Website: <https://sites.google.com/iitbbs.ac.in/isog2019>

International Conference On Case Histories And Soil Properties

Date: 05-12-2019 - 06-12-2019

Location: Furama Riverfront Hotel, Singapore,

Language: English

Organiser: Geotechnical Society of Singapore

Contact person: Geotechnical Society of Singapore

Address: 1 Liang Seah Street #02-11

Email: geoss@cma.sg

Website: <http://www.iccs2019.org>

Email: geoss@cma.sg

2020

International Conference on Geotechnical Engineering - Iraq

Location: Baghdad, Iraq

Date: 19-02-2020 - 20-02-2020

Organiser: Iraqi Scientific Society of Soil Mechanics and Foundation Engineering;

Contact person: Mahdi O Karkush;

Address: Aljadriah;

Phone: 07801058893;

Email: mahdi_karkush@coeng.uobaghdad.edu.iq;

Website: <http://issmfe.org/international-iraqi-geotechnical-conference/>

Event Diary (Con't)

14th Baltic Sea Geotechnical Conference 2020

Date: 25-05-2020 - 27-05-2020

Location: Clarion Hotel Helsinki, Finland

Language: English

Organiser: Finnish Geotechnical Society

Contact person: Leena Korkiala-Tanttu

Email: leena.korkiala-tanttu@aalto.fi

Website: <http://www.ril.fi/en/events/bsgc-2020.html>

Email: ville.raassakka@ril.fi

18th NGM Nordic Geotechnical Meeting

Date: 25-05-2020 - 27-05-2020

Location: Helsinki, Finland

Contact person: Ville Raassakka

Email: ville.raassakka@ril.fi

Website : <http://www.ril.fi/en/events/ngm-2020.html>

1st International Conference on Embankment Dams (ICED'2020): Dam Breach Modelling and Risk Disposal

Location: Beijing International Convention Center, Beijing, China,

Date: 05-06-2020 - 07-06-2020

Language: English

Organiser: ISSMGE TC210 on Embankment Dams;

Website: <http://iced-2020.host30.voosite.com/>;

Email: iced2020@163.com

XIII International Symposium on Landslides (13 ISL) - Cartagena 2020

Date: 15-06-2020 - 19-06-2020

Location: Hotel Las Américas, Cartagena, Colombia

Language: English

Organiser: Colombian Geotechnical Society

Contact person: Juan Montero Olarte

Address: Transversal 28B No. 37-47

Phone: 57 1 2694260

Email: isl2020@scg.org.co

Website: <http://www.scg.org.co>

International Conference on Geotechnical Engineering Education

Location: Greece, Athens

Date: 24-06-2020 - 25-06-2020

Language: English

Organiser: TC306

Contact person: Marina Pantazidou

Email: gee2020athens@gmail.com

Website: <https://www.gee2020.org>

Event Diary (Con't)

4th European Conference on Unsaturated Soils - Unsaturated Horizons

Location: Instituto Superior Técnico, Lisbon, Portugal,
Address: Av Rovisco Pais, 1
Date: 24-06-2020 - 26-06-2020
Language: English
Organiser: IST, TUDelft and UPC
Contact person: info@EUNSAT2020.tecnico.ulisboa.pt
Website: <http://www.EUNSAT2020.tecnico.ulisboa.pt>

TC204: Geotechnical Aspects of Underground Construction In Soft Ground - TC204 Cambridge 2020

Date: 29-06-2020 - 01-07-2020
Location: University of Cambridge, United Kingdom
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

3rd International Conference on Geotechnical Engineering

Location : Cinnamon Grand, Colombo ; Sri Lanka
Date : 10-08-2020 - 11-08-2020
Language : English
Organiser : Sri Lankan Geotechnical Society ;
Contact person: Dr. JSM Fowze;
Address: 415, Bauddhaloka Mawatha
Email: slgssecretariat@gmail.com;
Website: <http://icgecolombo.org/2020/index.php>

4th International Symposium on Frontiers in Offshore Geotechnics

Date: 16-08-2020 - 19-08-2020
Location: University of Texas, Austin, United States
Language: English
Organiser: ISFOG 2020 Organising Committee
Contact person: Phil Watson
Address: The University of Western Australia
Phone: 0418881280
Email: philip.watson@uwa.edu.au
Website: <http://www.isfog2020.org>

4th International Conference on Transportation Geotechnics (4th ICTG)

Location: Sheraton Grand Chicago, USA
Date: 30-08-2020 - 02-09-2020
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>

Event Diary (Con't)

6th International Conference on Geotechnical and Geophysical Site Characterization

Date: 07-09-2020 - 11-09-2020

Location: Budapest Congress Center, Hungary , Budapest

Language: English

Organizer: Hungarian Geotechnical Society

Contact person: Tamas Huszak

Address: Muegyetem rkp. 3.

Phone: 0036303239406

Email: huszak@mail.bme.hu

Website: <http://www.isc6-budapest.com>

Email: info@isc6-budapest.com

27th European Young Geotechnical Engineers Conference and Geogames

Location: National Research Moscow State University of Civil Engineering, Russia, Moscow

Date: 17-09-2020 - 19-09-2020

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: youngburo@gmail.com

Additional Information: <https://t.me/EYGEC2020>

2nd International Conference on Energy Geotechnics

Location: Robert Paine Scripps Forum for Science, Society and the Environment. La Jolla, CA, USA. , Date : 20-09-2020 - 23-09-2020

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>

3rd International Symposium on Coupled Phenomena in Environmental Geotechnics

Location: Kyoto University, Japan

Date: 29-10-2020 - 30-10-2020

Language: English

Organiser: TC215 (Environmental Geotechnics), Japanese Geotechnical Society (JGS), and Kyoto University

Contact person: Takeshi Katsumi

Address: Yoshida-honmachi

Phone: +81-75-753-9205

Fax: +81-75-753-5116

Email: katsumi.takeshi.6v@kyoto-u.ac.jp

Website: <https://cpeg2020.org>

Email: cpeg2020@geotech.gee.kyoto-u.ac.jp

Event Diary (Con't)

10th International Conference on Scour and Erosion

Location: DoubleTree Washington DC - Crystal City, USA,

Date: 15-11-2020 - 18-11-2020

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>

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/>

NON-ISSMGE SPONSORED EVENTS

2019

8th International Geotechnical Symposium

Date: 13-11-2019 - 15-11-2019

Location: Suleyman Demirel Kultur Merkezi, ITU Ayazaga Campus, Istanbul, Turkey

Language: English and Turkish

Organiser: UCTEA Turkish Chamber of Civil engineers, Istanbul Branch and Turkish Society for ISSMGE

Contact person: Kubilay Sahin

Email: bilimsel@geoteknik2019.org

Website: <http://www.geoteknik2019.org>

2020

2nd International Symposium on Seismic Performance and Design of Slopes

Location: John McIntyre Conference Centre in Pollock Halls, 18 Holyrood Park Road, Edinburgh EH16 5AY, UK,

Date: 18-01-2020 - 22-01-2020

Language: English

Organiser: The University of Edinburgh, UK

Contact person: Chongqiang Zhu, Ph.D.

Address: Institute for Infrastructure and Environment, School of Engineering, the University of Edinburgh, Thomas Bayes Road, Edinburgh EH9 3FG, UK

Phone: 441316505588

Email: v1czhu3@exseed.ed.ac.uk

Website: <https://www.isspds.eng.ed.ac.uk/>

Event Diary (Con't)

Geoamerica 2020

Location: Windsor Convention Expo Center, Rio de Janeiro; Brazil

Date: 26-04-2020 - 29-04-2020

Language: English

Organiser: International Geosynthetics Society;

Contact person: André Estêvão Silva;

Email: geoamericas2020@geoamericas2020.com;

Website: <http://www.geoamericas2020.com>

DFI Deep Mixing 2020

Dates: 15-06-2020 - 17-06-2020

Location: TBD, Gdansk, Poland

Organizer: Deep Foundations Institute

Contact person: Theresa Engler

Address: 326 Lafayette Avenue, Hawthorne, NJ 07506, USA

Phone: 19734234030

Fax: 19734234031

Email: tengler@dfi.org

Website: <http://www.dfi.org>

Email: staff@dfi.org

The 3rd International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering

Location: Dokuz Eylul University, Izmir, Turkey

Dates: 18-06-2020 - 20-06-2020

Organiser: Dokuz Eylul University

Contact person: Tugce Ozdamar Kul

Address: Dokuz Eylul University

Phone: +905325164800

Email: egrwse2020@gmail.com

Website: <http://www.egrwse2020.com>

16th International Conference of the International Association for Computer Methods and Advances in Geomechanics - IACMAG

Location: Politecnico di Torino Conference Centre, Italy ,

Date: 29-06-2020 - 03-07-2020 English

Organiser: Politecnico di Torino

Contact person: Symposium srl

Address: via Gozzano 14

Phone: +390119211467

Email: info@symposium.it

Email: marco.barla@polito.it

Event Diary (Con't)

7th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics

Location: The National Science Seminar Complex, India , Bengaluru

Date: 13-07-2020 - 16-07-2020

Organiser: Indian Society of Earthquake Technology

Contact person: Dr Ravi Jakka

Address: Department of Earthquake Engineering, Indian Institute of Technology Roorkee

Phone: + 91-1332-285591

Email: jakkafeq@iitr.ac.in

Website: <http://7icragee.org/index.php>

16th International Conference of the International Association for Computer Methods and Advances in Geomechanics - IACMAG

Location: Politecnico di Torino Conference Centre, Italy ,

Date: 29-06-2020 - 03-07-2020

Organiser: Politecnico di Torino

Contact person: Symposium srl

Address: via Gozzano 14

Phone: +390119211467

Email: info@symposium.it; marco.barla@polito.it

DFI 45th Annual Conference on Deep Foundations

Dates: 13-10-2020 - 16-10-2020

Location: Gaylord National Resort & Convention Center, Oxon Hill, MD, USA

Organizer: Deep Foundations Institute

Contact person: Theresa Engler

Address: 326 Lafayette Avenue, Hawthorne, NJ 07506, USA

Phone: 19734234030

Fax: 19734234031

Email: tengler@dfi.org

Website: <http://www.dfi.org>

Email: staff@dfi.org

Fifth World Landslide Forum

Dates: 02-11-2020 - 06-11-2020

Location: Kyoto International Conference Center, Kyoto, Japan

Organizer: International Consortium on Landslides

Contact person: Ryosuke Uzuoka

Address: Gokasho

Phone: +81-774-38-4090

Email: uzuoka.ryosuke.6z@kyoto-u.ac.jp

Website: <http://wlf5.iplhq.org/>

Email: secretariat@iclhq.org

FOR FURTHER DETAILS, PLEASE REFER TO THE WEBSITE OF THE SPECIFIC CONFERENCE

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The Foundation of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) was created to provide financial help to geo-engineers throughout the world who wish to further their geo-engineering knowledge and enhance their practice through various activities which they could not otherwise afford. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals.

- **Diamond: \$50,000 and above**

- a. ISSMGE-2010 <http://www.issmge.org/>



- b. Prof. Jean-Louis and Mrs. Janet Briaud
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<http://ceprofs.tamu.edu/briaud/>



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<http://www.i-igm.net/>



- b. Geo-Institute of ASCE
<http://content.geoinstitute.org/>



- c. Japanese Geotechnical Society
<http://www.jiban.or.jp/>



- d. The Chinese Institution of Soil Mechanics and Geotechnical Engineering - CCES
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- e. Korean Geotechnical Society
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- f. Comité Français de Mécanique des Sols et de Géotechnique
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- f. Chinese Taipei Geotechnical Society www.tgs.org.tw

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- h. East China Architectural Design and Research Institute *ECADI*
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- i. TC 211 of ISSMGE for Ground Improvement
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