



AUSTRIAN
SOCIETY FOR
GEOMECHANICS

70th GEOMECHANICS COLLOQUIUM

Georg Michael Vavrovsky Colloquium 2021

& 12th Austrian Tunnel Day 2021

13th – 16th OCTOBER 2021

SALZBURG CONGRESS, AUSTRIA



THE AUSTRIAN SOCIETY FOR GEOMECHANICS

is honoured to invite you to the 70th **Geomechanics Colloquium 2021** from 14th to 16th of October 2021 at the Congress Center „Salzburg Congress“, Auerspergstrasse 6, Salzburg, Austria.

Session topics:

- » Urban tunnelling
- » Dealing with geological risk
- » New developments in mechanized tunnelling
- » Innovative exploration methods ahead of the face



Previous to the Colloquium the **12th Austrian Tunnel Day** with the topics

- » Special challenges at large construction sites
- » New regulations for Tunnelling
- » Innovation award
- » Innovation and processing of tunnel construction projects - Ways into the future

is scheduled on the 13th of October 2021



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PREFACE

PROF. WULF SCHUBERT



Dear Colleagues,

Due to the pandemic, we could hold last year's Colloquium only virtually. This year the board of the ÖGG has decided to organize the 70th Geomechanics Colloquium again with physical presence. However, the bon mot: "Prediction is difficult, especially about the future" was never as valid as this year. Due to currently unknown possible restrictions in relation to the pandemic valid at the time of the Colloquium, in the moment a detailed planning of the event is close to impossible.

Presently we do not know, how many delegates will be admitted, and if the exhibition or the evening in the Stieglkeller can be held in the usual way.

We count on your understanding that the final program will be fixed later than usual, and registration starts delayed. As soon as the rules for the time of the Colloquium are known, we will let you know the details.

Virtual participation will be possible also this year. Details you find on our web page: www.geomechanics-congress.com

We sincerely hope to see as many as possible in Salzburg!

Glück Auf!

A handwritten signature in dark ink, appearing to be 'W. Schubert'.

Wulf Schubert

President of the Austrian Society for Geomechanics

AGENDA

THURSDAY, 13TH OCT. 2021

WELCOME **08:30 a.m.**

Welcome by W. Schubert,
President of the Austrian Society for Geomechanics

LAUDATIO GEORG MICHAEL VAVROVSKY **08:40 a.m.**

W. Schubert Graz University of Technology (A)

SPONSOR CONTRIBUTION **08:50 a.m.**

Here a contribution of Epiroc Deutschland GmbH (D) is presented

URBAN TUNNELLING **09:00 a.m.**

Chair

A. Rath PORR Bau GmbH (A)
M. Ossberger Wiener Linien GmbH & Co KG (A)

Settlements in urban areas - Evaluation of settlements on buildings as a result of complex underground constructions

S. Höser ILF Consulting Engineers Austria GmbH (A)
I. Bathaeian ILF Consulting Engineers Austria GmbH (A)

Swedish practice of urban tunnelling - from a perspective of a middle-european designer

N. Radonic	Amberg Engineering AG (A)
J. Vesely	Amberg Engineering AG (A)
R. Theiß	ISP ZT GmbH (A)

Artificial ground freezing as a consolidation measure for tunneling under Bern main station

S. Klösches	Thyssen Schachtbau GmbH (D)
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KAFFEPAUSE (20 min) **10:30 Uhr**

Intersection U2xU5 – Tunnelling works at the lot

Ch. Suchmann	Wiener Linien GmbH & Co KG (A)
Ch. Fuchs	ISP ZIVILTECHNIKER GmbH (A)

A26 Linz Motorway - A new landmark for Linz

F. Sempelmann	ASFINAG BAU Management GmbH (A)
K. Matt	ILF Consulting Engineers Austria GmbH (A)
F. Konrad	ILF Consulting Engineers Austria GmbH (A)

Innovative slurry solutions for demanding TBM drives through soil with high permeability in a dense urban area

D. Vialle	Implen France SA (F)
A. Hochart	Implen France SA (F)
A. Heim	Implen France SA (F)

LUNCH BREAK (85 min) **12:20 p.m.**

LEOPOLD MÜLLER AWARD 2021

01:45 p.m.

SPONSOR CONTRIBUTION :

02:00 p.m.

DSI Underground Austria GmbH (A)

DEALING WITH GEOLOGICAL RISK

02:15 p.m.

Chair

J. Herdina

TIWAG-Tiroler Wasserkraft AG (A)

W. Leitner

G. Hinteregger & Söhne Baugesellschaft mbH (A)

S 1 Tunnel Donau-Lobau – The complex road to geological exploration in the Donau-Auen National Park

T. Avender

Asfinag BMG (A)

T. Schröfelbauer

Asfinag BMG (A)

K. Permenschlager

Beitl ZT GmbH (A)

O. Montag

OM Ziviltechnik-Geologie (A)

Concluding report on the first phase of the BIM pilot project “new railway line Köstendorf – Salzburg” / Possible applications of a digital ground model in infrastructure projects

W. Gächter

Universität Innsbruck (A)

H. Exenberger

Universität Innsbruck (A)

A. Fasching

3G Gruppe Geotechnik Graz ZT GmbH (A)

S. Hillisch

IBK Ingenieurbüro Kronawetter ZT Ges.m.b.H (A)

G. Mülitzer

IGT Geotechnik und Tunnelbau ZT GmbH (A)

M. Seywald

SPIRK + Partner Ingenieure GmbH (A)

M. Rettenbacher

ÖBB-Infrastruktur GmbH (A)

G. Fleischmann

ÖBB-Infrastruktur GmbH (A)

G. Fröch

Universität Innsbruck (A)

M. Flora

Universität Innsbruck (A)

New insights into the contractual subsoil risk: a view beyond the Austrian horizon

M. Mesic

Keller Grundbau Ges.mBH (A)

COFFEE BREAK (30 min)

03:30 p.m.

Dispute Adjudication in Austrian Conditions of Contract for Underground Works

W. Purrer

CCC-Purrer (A)

Dealing with geological risk in Switzerland Mix Shield TBM on the Eppenbergr tunnel site Field report

M. Weh

Marti Tunnelbau AG (CH)

R. Pinazza

Marti Tunnelbau AG (CH)

Impact of alternative excavation concept on contractual allocation of ground risk at S 7 motor-way Tunnel Project Rudersdorf

P.J. Sellner

3G Gruppe Geotechnik Graz ZT GmbH (A)

W. Pacher

Swietelsky Tunnelbau GmbH & CoKG (A)

W. Weinmar

IGT - Geotechnik und Tunnelbau ZT GmbH (A)

H. Moser

ASFINAG BMG (A)

Y. Monsberger

ASFINAG BMG (A)

CHAMBER CONCERT

07:00 p.m.



With the support of the government of the province and the city of Salzburg, we invite the participants to a chamber concert in the **Residenz zu Salzburg** (Residenzpl. 1) on Thursday evening. The invitation to the chamber concert is attached to the conference documents.



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CONGRESS DINNER

07:00 p.m.

After the concert, the Austrian Society for Geomechanics with the kind support of



invites all participants of the colloquium as well as accompanying persons to the restaurant **STIEGLKELLER Salzburg** (Festungsgasse 10, after the fortress cable railway) in order to freely exchange thoughts with friends and gain new ones. The event starts at 7 p.m.



AGENDA

FRIDAY, 15TH OCT. 2021

NEW DEVELOPMENTS IN MECHANIZED TUNNELLING

09:00 a.m.

Chair

D. Bach	IGT - Geotechnik und Tunnelbau ZT GmbH (A)
M. Flora	Universität Innsbruck (A)

Geotechnical processes at the tunnel face as key to successful tunnelling

W. Steiner	B+S AG (A)
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Feeder 9 Gas Pipeline Replacement Tunnel – Achieving a world record for pipe insertion of a new gas pipeline within a tunnel beneath the river Humber (UK)

S. Jukes	PORR UK Ltd (GB)
S. Schenk	PORR Bau GmbH - Tunnelbau (A)

Initial project experiences with variable density TBMs in Europea

K. Bächler	Herrenknecht AG (D)
W. Burger	Herrenknecht AG (D)
F. Battistoni	Herrenknecht AG (D)
M. Schwärzel	Herrenknecht AG (D)
M. Flora	Herrenknecht AG (D)

Injection materials in tunnel excavation material - waste or substitute construction material?

G. Tintelnot	TPH Bausysteme GmbH (D)
M. Koch	Bfm Umwelt GmbH (D)

Added value in mechanized tunneling by intelligent systems

M. Flora	Universität Innsbruck (A)
A. Fontana	Pini Swiss Engineers SA (CH)
A. Ruepp	ÖBA Pini&Partner (A)
K. Bergmeister	Universität für Bodenkultur Wien (A)

Open TBM start without use of gripping applicated at the tailrace tunnel and incline shaft

M. Türtscher	G. Hinteregger & Söhne Baugesellschaft mbH (A)
S. Mark	illwerke vkw AG (A)
W. Leitner	G. Hinteregger & Söhne Baugesellschaft mbH (A)

LUNCH BREAK (60 min)

11:45 a.m.

INNOVATIVE EXPLORATION METHODS AHEAD OF THE FACE

12:45 p.m.

Chair

N. Gegenhuber

Montanuniversität Leoben (A)

B. Lehmann

DMT GmbH & Co. KG Civil & Mining Engineering (D)

Towards the integration of smart techniques for tunnel seismic applications

T. Dickmann

Amberg System (CH)

J. Hecht Méndez

Amberg System (CH)

D. Krüger

Amberg System (CH)

A. Sapronova

StormGeo (NO)

T. Marcher

TU Graz (A)

Review of the “Tunnel Seismic While Drilling” measurements during the construction of the Koralm tunnel at construction lot KAT2

W. Chwatal

AFRY Austria GmbH (A)

A. Domenig

AFRY Austria GmbH (A)

D. Kostial

AFRY Austria GmbH (A)

T. Rudel

AFRY Austria GmbH (A)

G. Schlögel

AFRY Austria GmbH (A)

E. Katzianer

ÖBB-Infrastruktur AG (A)

H. Wagner

ÖBB-Infrastruktur AG (A)

Combined exploration drilling with digital data management

T. Kratz

Thyssen Schachtbau GmbH (D)

M. Ouschan

Eguana GmbH (A)

G. Vogel

Thyssen Schachtbau GmbH (D)

Innovative geophysical exploration technologies in karst-prone and crystalline rock formations

M. Schmidt

Bo-Ra-tec GmbH (D)

T. Richter

Bo-Ra-tec GmbH (D)

R. Zenz

PORR Bau GmbH - ARGE Tunnel Alaufstieg
Aichelberg (A)

Highly specialized geophysical methods for underground construction works – Semmering Base Tunnel, a practice report

A. Radinger	Geodata Group (A)
T. Hofmann	ÖBB-Infrastruktur AG (A)
R. Holzer	Geoconsult Wien ZT GmbH (A)
F. Fasching	3D Gruppe Geotechnik Graz ZT GmbH (A)
D. Kusnirak	Geodata Group (A)

Alternative sources for seismic exploration in conventional tunnelling

I. Hartl	Montanuniversität Leoben (A)
I. Schlögel	Zentralanstalt für Meteorologie und Geodynamik (A)
M. Behm	Geodata Group (A)
R. Wenighofer	Montanuniversität Leoben (A)
R. Galler	Montanuniversität Leoben (A)

Closing Words

W. Schubert	Graz University of Technology (A)
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END OF THE SCIENTIFIC PROGRAM

03:15 p.m.

EXCURSION

SATURDAY, 16TH OCT. 2021

STORAGE POWER STATION KÜHTAI

Project information

With a usable storage capacity of about 31 mio m³, the new Kühtai reservoir is about half the size of the existing Finstertal reservoir. The dam is designed as a natural stone infill dam with a central earth core and a height of 113 m from the original valley floor to the dam crest. The full reservoir level is at 2,140 m above sea-level. All of the material used for the infill dam is extracted on site from the future reservoir and the tunnel excavation.

Similar to the two existing dams, natural stone and structural elements will be used for the airside dam surface to blend in the structure with the natural surroundings in the best possible way.

The Kühtai 2 power station with its headrace channel – a tunnel 4.5 m in diameter – connects the new Kühtai reservoir with the existing Finstertal reservoir. The power station is built completely underground in a rock cavern and is designed for pumped storage operation. Two pump turbines form the heartpiece of the station. These turbines are reversible, meaning their function and direction of rotation can be turned around: in turbine operation, up to 90 m³/s of water are flowing in the headrace channel from the Finstertal reservoir to the Kühtai reservoir with the turbine driving the generator, causing the generator to feed electricity into the grid.

The stream adduction – a tunnel 4.2 m in diameter and 25.5 km in length – with its six water intakes opens up an additional catchment area in the middle, eastern part of the Ötztal valley and the head of the Stubaital valley. The harnessed water is fed into the Kühtai reservoir at a slight gradient. Due to local conditions, two of the water intakes are situated slightly below the stream adduction; a pumping station is used to raise the water drawn off there to the level of the adduction.

As a general principle, the amount of water drawn off at the intakes conforms to ecologically compatible levels. Natural flow dynamics are maintained even if at a lower level. In the winter months no water is drawn off at all.



Foto: © TIWAG-Tiroler Wasserkraft AG



Foto: © TIWAG-Tiroler Wasserkraft AG

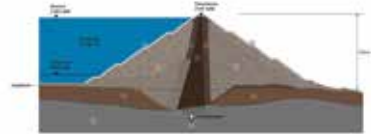


Foto: © TIWAG-Tiroler Wasserkraft AG

Preliminary schedule

08:00 a.m.	Departure at the Salzburg Congress Center by bus
10:30 a.m.	Arrival Power house/Visitor Center
10:35 a.m.	Project explanation and site visit
11:30 a.m.	Approach to Kühtai via Haimingerberg
12:00 p.m.	Lunch at Kühtai
01:30 p.m.	Visit of the dam construction site and various drives
03:00 p.m.	Return to Salzburg
05:30 p.m.	Expected arrival at the Salzburg Congress Center

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GENERAL

LANGUAGES

The conference languages at the Geomechanics Colloquium will be German and English. Simultaneous translation will be provided.

TECHNICAL EXHIBITION

Exhibition space and facilities accompanying the conference will be available at the symposium venue. Due to the great demand, interested companies are advised to **book early**. For further information, please contact the office of the Austrian Society for Geomechanics (salzburg@oegg.at). A list of the current exhibitors can be found on the homepage (www.oegg.at).

REGISTRATION AND PAYMENT

All participants are asked to complete the online registration form which can be found on the homepage of the Austrian Society of Geomechanics. After registration, you will receive an invoice. Please, specify by all means the **invoice number** as well as the **name of the participant** on the money transfer voucher.

Please do not send us a multiple application via email, use the online registration form. There you are also able to register several participants at once!

The registration is only valid after payment. You are able to pay by bank transfer or credit card. Following credit cards will be accepted: Visa, Master Card and Diners Club.

GENERAL

The payment has to be in Euro (€) and „**free of charge for the beneficiary**“.

The registration fee covers participation in the conference, the conference bag, the daily lunch, the congress dinner at Stieglkeller, and the chamber concert. Only persons under the age of 26 years without a regular salary are stated as „Students“ (reduced registration fee). Doctoral students are excluded from the discount.

Your participant card (participation ticket) as well as the conference documents will be handed out directly at the registration desk of the conference center (participant cards will NOT be shipped at all).

CANCELLATION

Please understand that we can only accept a written cancellation. When cancelling before the 1st of October 75 % of the fee will be refunded. If you are unable to attend or cancel later than the above mentioned date, no refund can be granted. The conference documents will be mailed on demand at receipt of payment.

We, however, gladly accept a substitute participant without demanding any additional charges.

ACCOMMODATION

For the conference participants special conditions with hotels in each category are available. Please note that the booking has to be done by the conference organizer. Therefore, please book online on the symposium homepage (www.oegg.at) or use the enclosed form. On the homepage as well as on the attached form a table summarizes all hotels with respective conditions in vicinity of the symposium venue.

GENERAL

PROCEEDINGS

The papers of the Salzburger Geomechanics Colloquia are published by Wilhelm Ernst & Sohn Verlag, Berlin, Germany, in the bi-monthly periodical of the Austrian Society for Geomechanics.

GEOMECHANICS AND TUNNELLING

The journal can be ordered at:

**Wilhelm Ernst & Sohn Verlag für Architektur und
technische Wissenschaften GmbH & Co. KG**

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For members of the Austrian Society for Geomechanics the periodical „Geomechanics and Tunnelling“ is free!

A membership can be applied for at

Austrian Society for Geomechanics

Innsbrucker Bundesstraße 67, 5020 Salzburg, AUSTRIA

Tel.: +43 662 875519

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or directly at the homepage: www.oegg.at

ADVERTISING OPPORTUNITIES

Take the unique possibility to become a sponsor of the Geomechanics Colloquium 2021 and put your company in perspective! The following tables give an overview on possible sponsorship packages. For details on each package please visit our homepage www.oegg.at or contact the office of the Austrian Society for Geomechanics (salzburg@oegg.at).

Premium Packages		
Platinum	EUR 8,000	available
Gold	EUR 5,500	available
Silver	EUR 3,000	available
Congress dinner	EUR 10,000	not available
Lunch (3 days)	EUR 5,500	not available

Supporter Packages		
Bullet Point	EUR 2,500	not available
Machine	EUR 2,000	available
Mannerschnitten	EUR 2,500	not available
Scratchpad	EUR 1,700	not available
Detailed Program	EUR 1,500	not available
Web-Banner	EUR 1,000-3,000	not available
Banner	EUR 500-1,750	available
Key Strap	EUR 2,000	available
Pocket Program	EUR 800	available
Advertising Supplement	EUR 500	available

GENERAL

71st GEOMECHANICS COLLOQUIUM

The Austrian Society for Geomechanics proudly announces that the **71st Geomechanics Colloquium** will be held from 10th to 12th of October 2022 at the Congress Center in Salzburg.

The topics of this congress you may retrieve from our homepage www.oegg.at or, respectively, they are added to the conference materials of the 70th Geomechanics Colloquium.

LEOPOLD MÜLLER AWARD

For excellent doctoral theses with practical relevance in the area of rock mechanics and geological engineering the Austrian Society for Geomechanics awards annually the **LEOPOLD MÜLLER AWARD**.

The Austrian Society for Geomechanics invites to submit doctoral theses that apply a holistic approach - in the spirit of Leopold Müller - to geomechanics and geology and that correspond to the objectives of the Austrian Society for Geomechanics - accompanied by a short evaluation of the thesis by the university institute in question. Applications should be submitted **latest by the end of January 2022** online at the homepage of the Austrian Society for Geomechanics (www.oegg.at).

Further information regarding the Leopold-Müller-Award can be retrieved from our homepage: www.oegg.at.



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GENERAL

MEMBERSHIP

To become member of the Austrian Society for Geomechanics is worth it!

For the Geomechanics Colloquium, which is taking place every year in October, there are **special conference fees** for members. Also the bi-monthly periodical of the Austrian Society for Geomechanics „**Geomechanics and Tunnelling**“ (published in English/German) is **included in the membership fees**.

Members taking place at the Geomechanics Colloquium and get the periodical „Geomechanics and Tunnelling“ save costs of more than EUR 150.00! Register on: www.oegg.at

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GEOTECHNIK
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REGISTRATION FEES

Tunnel Day & Geomechanics Colloquium inkl. virtual access

Registration	before 08/09/21	after 08/09/21
Regular participants	€ 605,-	€ 655,-
OeGG & ISRM members	€ 525,-	€ 565,-
Retired persons	€ 365,-	€ 390,-
Students*	€ 105,-	€ 130,-

Only VIRTUAL access until the end of the year

Regular participants	€ 250,-	€ 270,-
OeGG & ISRM members	€ 220,-	€ 250,-
Retired persons	€ 200,-	€ 220,-
Students*	€ 0,-	€ 70,-

Only Geomechanics Colloquium inkl. virtual access

Registration	before 08/09/21	after 08/09/21
Regular participants	€ 440,-	€ 490,-
OeGG & ISRM members	€ 360,-	€ 400,-
Retired persons	€ 200,-	€ 225,-
Students*	€ 75,-	€ 100,-

Only VIRTUAL access until the end of the year

Regular participants	€ 150,-	€ 170,-
OeGG & ISRM members	€ 120,-	€ 150,-
Retired persons	€ 100,-	€ 120,-
Students*	€ 0,-	€ 50,-

ATTENTION: From 10/01/21 a surcharge of € 50.- will be charged!

Social Program

Excursion (10/16/21)	€ 80,-
Chamber concert (10/14/21)	free
Buffet Dinner Stieglkeller (10/14/21)	free

* „Students“ are persons under 26 years of age, enrolled at a University (without regular salary).

At the online registration a valid study record has to be uploaded.

** Only one person per lecture free.

SAVE THE DATE:



See you in Salzburg!

15TH ISRM CONGRESS

SALZBURG, 09TH TO 14TH OF OCTOBER 2023



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