



12<sup>th</sup> International Conference  
**Tunnel Safety and Ventilation**  
April 16-18, 2024  
Graz, Austria

**Program**  
April 2024

## Graz University of Technology



As the name suggests, Graz University of Technology (TU Graz) is located in the center of Graz, the second biggest city in Austria. With eight institutions of higher education, Graz is a real student city and is regarded as one of the cities of Europe with the highest quality of life. "Science - Passion - Technology" is the guiding principle for research and teaching in all technological and scientific disciplines at TU Graz. The internationally recognized scientific strengths are covered by five Fields of Expertise. TU Graz is dedicated to work closely with well-known scientific institutions and businesses in Austria and abroad. Successful teams of students, talented up-and-coming scientists, ambitious researchers and a lively start-up scene enjoy an inspirational environment as well as access to top-quality equipment.

## Institute of Thermodynamics and Sustainable Propulsion Systems



The Institute of Thermodynamics and Sustainable Propulsion Systems (ITnA) at Graz University of Technology is dedicated to providing innovative and internationally recognized teaching and research in the interconnected system energy, engines, traffic and environment and to contributing to the solution of problems that affect the environment.

## Research Area Traffic and Environment



Focus of the Research Area Traffic and Environment is placed on ventilation, fire safety and environmental issues concerning road and railway tunnels. Activities here entail undertaking theoretical investigation, system design, onsite testing of ventilation and safety systems, and performance of fire and systems tests. An additional focus is placed on urban air quality, pollution dispersion and air quality measurements, including an accredited measurement laboratory for measuring particles of the fractions  $PM_{10}$  and  $PM_{2.5}$  as well as the pollutants  $NO_x$ ,  $NO$  and  $O_3$ .



## Date

International Conference: April 16-17, 2024  
Technical Visit: April 18, 2024

## Venue

Messecongress Graz, Messeplatz 1, 8010 Graz, Austria  
<https://mcg.at/en/locations/messecongress-graz>

## Conference Languages

English and German - Simultaneous translation

## Conference Proceedings

Papers and/or presentations will be available in digital form

## Organization

Michael BACHER	TU Graz, ITnA
Patrik FÖSSLEITNER	FVTmbH
Elisabeth HOLLER	FVTmbH
Sabine MINARIK	TU Graz, ITnA

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## Scientific Directors

Michael BACHER	TU Graz, ITnA
Peter STURM	TU Graz, ITnA

## Scientific Committee

Rune Brandt	HBI Haerter AG, CH
Ignacio Del Rey	TYPASA - Técnica y Proyectos S.A., ES
Arnold Dix	Barrister-at-Law, AU
Norris Harvey	Mott MacDonald, US
Haukur Ingason	RISE - Rise Research Institutes of Sweden, SE
Ingo Kaundinya	Federal Highway Research Institute (BAST), DE
Bernhard Kohl	ILF Consulting Engineers Austria GmbH, AT
René List	ASFINAG Bau Management GmbH, AT
Antoine Mos	CETU - Centre d'études des tunnels, FR
Günter Rattei	ASFINAG Service GmbH, AT
Conrad Stacey	Stacey Agnew, AU
Alan Vardy	University of Dundee and Dundee Tunnel Research, GB
Frédéric Waymel	Egis Group, FR
Sonja Wiesholzer	Schiene OÖ GmbH, AT

8:00 - 9:00	<b>Registration</b>
9:00 - 9:15	<b>Opening Session</b> <b>Welcome and Opening</b> <b>Peter Sturm<sup>1</sup>, Helmut Eichlseder<sup>2</sup>, Andrea Höglinger<sup>3</sup></b> 1: Conference Director, 2: Graz University of Technology - Head of Institute of Thermodynamics and Sustainable Propulsion Systems (ITnA); 3: Graz University of Technology - Vice Rector for Research
9:15 - 10:15	<b>Keynote Speakers</b> <b>9:15 - 9:35</b> <b>The 33 KM Long Koralm Tunnel – Final Challenges in the Implementation of a Major Project</b> <b>Klaus Schneider, Helmut Steiner</b> ÖBB Infrastruktur AG, AT <b>9:35 - 9:55</b> <b>Current Status of the Semmering Base Tunnel</b> <b>Gerhard Gobiet, Thomas Thaller</b> ÖBB Infrastruktur AG, AT <b>9:55 - 10:15</b> <b>Tunnel Renovation Program AUSTRIA - Next Level</b> <b>Andreas Fromm</b> ASFINAG, AT
10:15 - 11:00	<b>Coffee Break</b> - Kindly supported by Zitron Nederland
11:00 - 12:20	<b>Session S1: Energy &amp; Sustainability</b> Chair: <b>Rune Brandt</b> , HBI Haerter AG, CH <b>11:00 - 11:20</b> <b>Sustainable Energy Consumption</b> <b>Benjamin Riedl, Johannes Bösl, Ersin Gündogdu</b> ILF Consulting Engineers Austria GmbH, AT <b>11:20 - 11:40</b> <b>Energylabel &amp; Ecodesign for Austrian Roadtunnel</b> <b>Mario Patigler</b> ASFINAG, AT <b>11:40 - 12:00</b> <b>Sustainable Tunnel Operation Generation of Electricity Through Thermal and Pressure-Driven Airflows</b> <b>Peter Sturm<sup>1</sup>, Dietmar Harbauer<sup>2</sup>, Roland Seebacher<sup>3</sup>, Daniel Fruhwirt<sup>1</sup>, Klaus Krischan<sup>3</sup></b> 1: Graz University of Technology, Institute of Thermodynamics and Sustainable Propulsion Systems, (ITnA) AT; 2: ASFINAG, AT; 3: Graz University of Technology, Institute of Electric Devices and Machines, AT <b>12:00 - 12:20</b> <b>Validation of Simplified Variable-Speed Control for Road Tunnel Jet Fans</b> <b>Kaïto Onoda<sup>1</sup>, Ryoichi Ishizawa<sup>1</sup>, Keigo Hatamoto<sup>2</sup>, Hibiki Sako<sup>3</sup>, Toshiaki Sakaguchi<sup>3</sup>, Alan Vardy<sup>4</sup></b> 1: Hanshin Expressway Company Ltd., JP; 2: Hanshin Expressway Research Institute for Advanced Technology, JP; 3: Sohatsu Systems Laboratory Inc., JP; 4: University of Dundee, Dundee, Scotland, GB
12:20 - 13:30	<b>Lunch</b> - Kindly supported by the Mayor of the City of Graz, Ms. Elke Kahr.
	<b>Session G1: Evacuation</b> Chair: <b>Frédéric Waymel</b> , Egis Group, FR <b>11:00 - 11:20</b> <b>Influence of Acoustic Tunnel Monitoring AKUT on Tunnel Safety</b> <b>Katharina Hoyer<sup>1</sup>, Mark Dobroung<sup>2</sup>, Franz Graf<sup>3</sup>, Harald Kammerer<sup>1</sup>, Regina Schmidt<sup>1</sup>, Thomas Kalina<sup>2</sup></b> 1: ILF Consulting Engineers Austria GmbH, AT; 2: ASFINAG, AT; 3: Joanneum Research, AT <b>11:20 - 11:40</b> <b>Evacuation Safety and Human Emotional Responses in Smoke-Filled Tunnels for Machine Learning Insights</b> <b>Wenhao Li, Miho Seike, Akimasa Fujiwara, Makoto Chikaraishi</b> Hiroshima University, JP <b>11:40 - 12:00</b> <b>A 3D Parametric Study To Assess the Impact of a Fixed Fire Fighting System on the Evacuation Conditions in Paris La Défense Road Tunnels</b> <b>Nicolas Bourlet, Adrien Host, Florent Guiral, Frederic Waymel</b> EGIS, FR <b>12:00 - 12:20</b> <b>Fire Risks of Battery-Powered Trucks in Tunneling</b> <b>Patrik Föbleitner<sup>1</sup>, Bastiaan Lottman<sup>2</sup>, Oliver Heger<sup>2</sup>, Bernhard Kohl<sup>2</sup>, Peter Sturm<sup>1</sup>, Arild Søvik<sup>3</sup>, Torstein Ingvaldsen<sup>2</sup></b> 1: Graz University of Technology, Institute of Thermodynamics and Sustainable Propulsion Systems, Austria; 2: ILF Consulting Engineers Austria GmbH, AT; 3: Sovik Consulting

	<b>Session S2: Railway Systems</b> Chair: <b>Helmut Steiner</b> , ÖBB Infrastruktur AG, AT <b>13:30 - 13:50</b> <b>Evaluation of Trackway Ventilation System for the New Metro Line in Singapore</b> <b>Jessleen Chua, Gerald Louis, Linfan Cai, Ernest Poon, Hadi Wijaya, Melvyn Thong</b> Land Transport Authority, SG <b>13:50 - 14:10</b> <b>Condensation in Below Ground Metro Stations</b> <b>Paul Jolley, Mark Gilbey, Robert Jones</b> WSP UK Ltd, GB <b>14:10 - 14:30</b> <b>Metro Ventilation System in Seismic Areas</b> <b>Romano Borchiellini<sup>1</sup>, Davide Papurello<sup>2</sup>, Carlo Barbeta<sup>3</sup></b> 1: Energy Center, Via Borsellino 38/18, Politecnico di Torino, IT; 2: Dept. of Energy Galileo Ferraris, Politecnico di Torino, IT; 3: Systemair GmbH, Germany/Systemair Srl, IT <b>14:30 - 14:50</b> <b>Experiences From Five Years of PM Monitoring in Railway Tunnels of Austrian Federal Railways (ÖBB)</b> <b>Daniel Fruhwirt<sup>1</sup>, Michael Bacher<sup>1</sup>, Helmut Steiner<sup>2</sup></b> 1: Graz University of Technology, Institute of Thermodynamics and Sustainable Propulsion Systems, (ITnA), AT; 2: ÖBB Infrastruktur AG, AT	<b>Session G2: Commissioning</b> Chair: <b>René List</b> , ASFINAG, AT <b>13:30 - 13:50</b> <b>Rehabilitation of Boston Harbour Tunnel – The “Quarter Duct” Solution</b> <b>Conrad Stacey<sup>1,2</sup>, Michael Beyer<sup>1</sup></b> 1: Stacey Agnew, AU; 2: Delve Stacey Agnew, US <b>13:50 - 14:10</b> <b>Commissioning of Tunnels</b> <b>Tor Tybring Aralt</b> Multiconsult Norge AS, NO <b>14:10 - 14:30</b> <b>Enhancing Tunnel Fan Reliability Through Advanced Factory Acceptance Test (AFAT) to Prevent Failures</b> <b>Justo Suarez<sup>1</sup>, Jye Teoh<sup>2</sup>, Albert Bach-Esteve<sup>3</sup></b> 1: S&P-KRUGER Underground Ventilation Division, ES; 2: KRUGER ASIA Ventilation Group, TH; 3: SOLER & PALAU Ventilation Group, ES <b>14:30 - 14:50</b> <b>Advances in the Digital Documentation of Railway Tunnel Inspection</b> <b>Matthias J. Rebhan<sup>1</sup>, Stefan S. Grubinger<sup>2</sup>, Andreas Schüppel<sup>2</sup>, Simona Deutinger<sup>3</sup>, Gernot Schwarzenberger<sup>3</sup></b> 1: Graz University of Technology, AT; 2: recordIT GmbH, AT; 3: ÖBB Infrastruktur AG, AT
13:30 - 14:50	<b>Coffee Break</b> - Kindly supported by FVT mbH	
14:50 - 15:30	<b>Session S3: Alternative Propulsion Systems</b> Chair: <b>Conrad Stacey</b> , Stacey Agnew, AU <b>15:30 - 15:50</b> <b>Safety Challenges in an Underground Hyperloop System: A Preliminary Investigation</b> <b>Matteo Pachera<sup>1</sup>, Maarten Vanneste<sup>2</sup>, Thijs Verrecas<sup>2</sup>, Bartek Kulig<sup>3</sup></b> 1: Sweco, BE; 2: Denys, BE; 3: Hard-T, NL <b>15:50 - 16:10</b> <b>Widespread of Electric Vehicles and the Provision of Knowledge About Fire Accidents for Expressway Maintenance Workers in Japan</b> <b>Masahiro YOKOTA<sup>1</sup>, Ken-ichiro YAMAZAKI<sup>1</sup>, Tetsuya YAMAZAKI<sup>2</sup>, Chihiro SUGAWARA<sup>2</sup>, Toshio SUZUKI<sup>2</sup></b> 1: Central Nippon Highway Engineering Tokyo Company Limited, JP; 2: Nippon Expressway Research Institute Company Limited, JP	<b>Session G3: Simulation</b> Chair: <b>Antoine Mos</b> , CETU - Centre d'études des tunnels, FR <b>15:30 - 15:50</b> <b>Particle Concentration Levels in a Subway Station - The Effects of Various Locations and Diameters of Relief Shafts in Tunnels</b> <b>Omid Abouali, Erik Östblom, Per Sahlin</b> EQUA Simulation AB, SE <b>15:50 - 16:10</b> <b>Emission Management in Railway Tunnels With a 1D-3D Simulation Approach</b> <b>Evangelos Antoniou<sup>1</sup>, Arnaud Colleon<sup>2</sup>, Tom Linden<sup>3</sup>, Francesco Cuzzola<sup>1</sup></b> 1: Dassault Systèmes Deutschland GmbH, DE; 2: Dassault Systèmes SE, FR; 3: Dassault Systèmes AB, SE
15:30 - 16:30	<b>16:10 - 16:30</b> <b>Preliminary Tests of Mechanical Abuse - Nail Tests of LIBs</b> <b>Davide Papurello<sup>1,3</sup>, Beatrice Braghioroli<sup>1</sup>, Silvia Bodoardo<sup>2,3</sup>, Julia Amici<sup>2,3</sup>, Romano Borchiellini<sup>1,3</sup></b> 1: Department of Energy (DENERG), Politecnico di Torino, IT; 2: Department of Applied Science and Technology (DISAT), Politecnico di Torino, IT; 3: Energy Center, Politecnico di Torino, IT	<b>16:10 - 16:30</b> <b>Application of ARTU Software and Multizone Fire Modelling for Risk Analysis: A Road Tunnel Case Study</b> <b>Rugiada Scozzari, Michele Fronterre</b> Cantene, IT
16:30 - 16:45	<b>Informative presentation about the Technical Visit</b>	
16:45 - 19:30	<b>Conference Dinner</b> - Kindly supported by the Governor of Styria, Mag. Christopher Drexler. Only for people registered for this event.	
19:30 - 21:00		

We are pleased to invite you to the Conference Dinner supported by the Styrian Government.

### Guided city tour through the old town of Graz

#### Meeting point:

17:00 Venue/ Messecongress or 17:30 Main square / City hall

Final destination: Alte Universität Graz

### Conference Dinner

19:30 - 21:00

Location: Alte Universität Graz  
Hofgasse 14, 8010 Graz  
[www.alte-universitaet.at](http://www.alte-universitaet.at)



For questions or further information please contact us via:

[tunnel-graz@ivt.tugraz.at](mailto:tunnel-graz@ivt.tugraz.at)

Phone: +43 316 873-30213 or +43 316 873-30023



**Session S4: Mining & Artificial Intelligence**Chair: **Ignacio Del Rey**, TYPSA - Técnica y Proyectos S.A., ES**9:00 - 9:20****AI in Roadtunnel – Supporting the Man-In-The-Loop in Roadtunnel (SMaRT)****Philipp Böhnke<sup>1</sup>, Tom Schumann<sup>2</sup>, Dirk Kemper<sup>2</sup>, Alvaro Garcia-Hernandez<sup>2</sup>**

1: ave Verkehrs- und Informationstechnik GmbH, DE; 2: RWTH Aachen University, Lehrstuhl und Institut für Straßenwesen (ISAC), DE

**9:20 - 9:40****Application of AI to the 1D Ventilation Analysis of a 43KM Complex Road Tunnel Network: Madrid Calle30****Juan Manuel Sanz Sacristán<sup>1</sup>, Fabián de Kluijver<sup>2</sup>, Alberto López de Arriba<sup>2</sup>, Javier Berges<sup>3</sup>, Mar Martínez Yebra<sup>3</sup>, Guillem Peris<sup>1</sup>**  
1: Sener, ES; 2: JVVA, ES; 3: Madrid Calle 30, ES**9:40 - 10:00****Estimating the Seasonal Performance of a Surface Refrigeration Cooling Plant for an Underground Mine****Jolyon Thompson<sup>1</sup>, Mark Gilbey<sup>1</sup>, Hugo Dello Sbarba<sup>2</sup>**  
1: WSP UK Ltd, GB; 2: Dello Ventilation, CA**10:00 - 10:20****Design of a Ventilation System in a Tunnel Bored With a TBM machine in the Case of Methane Emission From a Rock Mass****Marek Borowski, Klaudia Zwolińska-Gładys, Andrzej Szmuk, Kamil Piech, Zbigniew Kuczera**  
AGH University of Krakow, PL**Session G4: Risk Analysis**Chair: **Norris Harvey**, Mott MacDonald, US**9:00 - 9:20****Risk Analysis of Road Tunnels: A Quantitative Risk Analysis Model for Assessing the Effects of Fire****Razieh Khaksari Haddad<sup>1</sup>, Zambri Harun<sup>2</sup>**

1: LONDON BRIDGE ASSOCIATES LTD., GB; 2: National University of Malaysia, MY

**9:20 - 9:40****Some Questions Related to CFD Modeling of Pressurized Tank Burst in Road Tunnels****Guillaume Lecocq<sup>1</sup>, Heudier Laure<sup>1</sup>, Truchot Benjamin<sup>1</sup>, Mos Antoine<sup>2</sup>, Willmann Christophe<sup>2</sup>**  
1: INERIS, FR; 2: CETU, FR**9:40 - 10:00****Integration of New Energy Carriers in French Specific Hazard Investigations: Overview of Principal Issues****Christophe Willmann, Pauline Charles**  
CETU, French tunnel study centre, FR**10:00 - 10:20****Innovative Approach To Improve the Safety of Tunnels and Tunnel Control Centres****Harald Kammerer<sup>1</sup>, Anne Lehan<sup>2</sup>, Bernhard Klampfer<sup>1</sup>**  
1: ILF Consulting Engineers Austria GmbH, AT; 2: Federal Highway Research Institute, DE**12:20****-****13:20****Lunch****Session S6: Tunnel Ventilation**Chair: **Ingo Kaundinya**, Federal Highway Research Institute (BAST), DE**13:20 - 13:40****One-Dimensional Critical Velocity Formulation – An Assessment of the Deficiency of the Current Models and the Introduction of a New Concept****J. Greg Sanchez**

TYLin, US

**13:20****-****14:20****13:40 - 14:00****Confinement Velocity for Smoke in Tunnels – How to Poke a Stick at it****Michael Beyer<sup>1</sup>, Conrad Stacey<sup>1,2</sup>**

1: Stacey Agnew, AU; 2: Delve Stacey Agnew, US

**14:00 - 14:20****Design, Refurbishment and Operation of the Ventilation in the Road Tunnel Complex in Prague****Ludvík Šajtar, Jan Pořízek, Jiří Zápalka**

Satra spol. s r. o., CZ

**14:20****-****14:50****Coffee Break****Session S7: Closing Session**Chair: **Bernhard Kohl**, ILF Group Holding GmbH, AT**14:50 - 15:10****Hydrogen Powered Vehicles in a Tunnel Incident – Risks and Consequences****Martin Aggarwal<sup>1</sup>, Daniel Fruhwirt<sup>2</sup>, Patrik Föbleitner<sup>3</sup>, Oliver Heger<sup>4</sup>, Patrick Pertl<sup>1</sup>, Regina Schmidt<sup>4</sup>, Alexander Trattner<sup>1</sup>**

1: HyCentA Research Ltd., AT; 2: Graz University of Technology, Institute of Thermodynamics and Sustainable Propulsion Systems, (ITnA) AT; 3: FVT Ltd., AUT; 4: ILF Consulting Engineers, AUT

**14:50****-****15:00****15:10 - 15:30****LeanTech in Road Tunnels****Simon Frey<sup>1</sup>, Rune Brandt<sup>1</sup>, Jean-Paul Schnetz<sup>2</sup>**

1: HBI Haerter AG, CH; 2: JPS-Conseils, CH

**15:30 - 15:50****Looking to the Future From PIARC's Perspective****Ingo Kaundinya**

Federal Highway Research Institute (BAST), DE

**15:50 - 16:00****Closing Remarks****Michael Bacher, Peter Sturm**

Graz University of Technology - Conference Directors

**9:00**  
**-**  
**10:20****Coffee Break** - Kindly supported by FVT mbH**Session S5: CFD Simulation**Chair: **Alan E. Vardy**, University of Dundee and Dundee Tunnel Research, GB**11:00 - 11:20****CFD-assisted Flow Rate Measurements in Ventilation Ducts of long Road Tunnels****Paolo Levoni<sup>1</sup>, Diego Angeli<sup>2</sup>, Elisabetta Salerno<sup>2</sup>, Giovanni Sebastiano Barozzi<sup>3</sup>, Paolo Verraz<sup>4</sup>, Cedric Petitcolin<sup>4</sup>**

1: Mimesis s.r.l., Modena, IT; 2: DISMI - University of Modena and Reggio Emilia, IT; 3: DIEF - University of Modena and Reggio Emilia, IT; 4: TMB-GEIE, Courmayeur (AO), Italy and Chamonix, FR

**11:20 - 11:40****Jet Fan Installation Factor Correlations for Conventional Jet Fans and MoJets****Fathi Tarada<sup>1</sup>, Pier Bertacche<sup>1</sup>, Luca Stantero<sup>2</sup>**

1: Mosen Ltd, GB; 2: Risk Design Engineering SRL, IT

**11:40 - 12:00****CFD Investigation of the Improvement of Smoke Control in a Tunnel Equipped With a Longitudinal and a Transverse Ventilation System****Gabriel Remion<sup>1</sup>, Antoine Mos<sup>1</sup>, Pietro Salizzoni<sup>2</sup>, Massimo Marro<sup>2</sup>, Stefano Lanzini<sup>2</sup>**

1: Centre d'étude des tunnels, FR; 2: Laboratoire de Mécanique des Fluides et d'Acoustique, Université de Lyon, FR

**12:00 - 12:20****An Analysis of the 3D Critical Region Length in Longitudinally Ventilated Tunnels During Fire Events****Pablo Ayala, Luis Amo, Alexis Cantizano**

Institute for Research in Technology, ICAI, Comillas Pontifical University, ES

**Session G5: Tunnel Ventilation**Chair: **Sonja Wiesholzer**, Schiene OÖ GmbH, AT**11:00 - 11:20****On the Optimum Interaction Between Ventilation and Emergency Exits****Marco Bettolini**

Amberg Engineering AG, CH

**11:20 - 11:40****Advanced Characterisation of a Fan Submitted to Piston Effect****Elisa Beraud<sup>1</sup>, Benoît Houseaux<sup>1</sup>, Sydney Tekam<sup>2</sup>**

1: Eiffage, Ventilation des Espaces Souterrains, FR; 2: Tech'Am Ingénierie, FR

**11:40 - 12:00****Optimizing Safety in Short High-Slope Road Tunnels: Smoke Propagation and Ventilation System Response****Robert Keser<sup>2</sup>, Miodrag Drakulić<sup>1</sup>, Krešimir Ivanek<sup>1</sup>, Željko Špiljar<sup>3</sup>**

1: CTP PROJEKT d.o.o., HR; 2: IN SILICO d.o.o., HR; 3: INVENTO VENTILACIJA d.o.o., HR

**12:00 - 12:20****How Information Security Can Be Ensured in Tunnel Systems****Gerhard Hudecek**

ASFINAG Mautservice GmbH, AT

**Sponsored by:**

There is a unique opportunity to view parts of the technical equipment of the Koralmtunnel! The Technical Visit will take place at the newly built Weststeiermark train station and the Leibenfeld ventilation center.

**08:30 Departure** by bus from Venue / Messecongress Graz

**09:15 Arrival**  
Building site facility (Schönaich 108/1, 8521 Wettmannstätten)

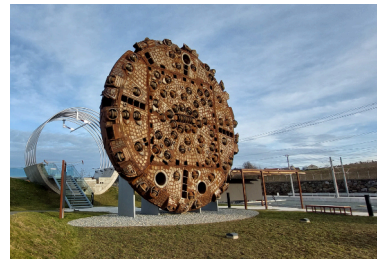
**Visiting:**

- Infopark Weststeiermark
- Tour within train station Weststeiermark
- Inspection of portal Koralmtunnel and first cross-cut
- Inspection of Leibenfeld ventilation center

**Lunch** at Building site facility

**15:00 Bus stop** at Airport Graz

**15:30 Arrival** Venue / Messecongress (expected)



Please take care that we are entering a construction site – hence dirt cannot be avoided!

Solid shoes are necessary. Participation is at your own risk.

**WLAN-Access:**

SSID: TSV2024  
Password: tunnel24



**This event is organized by:**



Institute of Thermodynamics  
and Sustainable Propulsion  
Systems



Forschungsgesellschaft für  
Verbrennungskraftmaschinen  
und Thermodynamik mbH



Graz  
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**In cooperation with:**



Austrian National Committee of the  
World Road Association



Österreichische Forschungsgesellschaft  
Straße-Schiene-Verkehr

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**- SAVE THE DATE -**

13<sup>th</sup> International Conference  
**Tunnel Safety and Ventilation**

April 20-22, 2026

Graz, Austria