



13th International Conference
Tunnel Safety and Ventilation

April 21-22, 2026

Graz, Austria

Program



TUNNEL SAFETY AND VENTILATION
Graz, Austria • www.tunnel-graz.at

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 PM₁₀ and PM_{2.5} as well as the pollutants NO_x, NO and NO₂.



Date

International Conference: April 21-22, 2026
 Technical Visit: April 23, 2026

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 will be available in digital form

Organization

Michael Bacher		Graz University of Technology
Daniel Fruhwirt		Graz University of Technology
Elisabeth Holler		Graz University of Technology

Contact

Graz University of Technology
 Institute of Thermodynamics and Sustainable Propulsion Systems

Inffeldgasse 19	phone: +43 316 873 30023
8010 Graz	mail: tunnel-graz@ivt.tugraz.at
Austria	web: https://tunnel-graz.at

Conference Director

Michael Bacher		Graz University of Technology
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Scientific Committee

Rune Brandt		HBI Haerter AG, CH
Raphael Defert		Amberg Engineering AG, CH
Ignacio Del Rey		TYPSA Group, ES
Daniel Fruhwirt		Graz University of Technology, AT
Norris Harvey		Mott MacDonald, US
Haukur Ingason		RISE - Research Institutes of Sweden, SE
Ingo Kaundinya		BAST - Federal Highway Research Institute, DE
Bernhard Kohl		ILF Consulting Engineers Austria GmbH, AT
Antoine Mos		CETU - Centre for Tunnel Studies, FR
Günter Rattei		ASFINAG, AT
Conrad Stacey		Stacey Agnew Pty Ltd., AU
Peter Sturm		Graz University of Technology, AT
Alan Vardy		University of Dundee and Dundee Tunnel Research, GB
Frédéric Waymel		Egis Group, FR

Tuesday - April 21, 2026

8:00am - 9:00am	Registration
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9:00am - 9:25am	<p>Location: Hall Styria Welcome and Opening</p> <p>Andrea HÖGLINGER¹, Christian TRAPP² 1: Graz University of Technology – Vice Rector for Research, AT 2: Graz University of Technology – Head of Institute of Thermodynamics and Sustainable Propulsion Systems, AT</p> <p>Welcome Address from PIARC Alexander WALCHER, Vice President of the World Road Association PIARC and president of the Austrian National Committee of PIARC</p>
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9:25am - 10:25am	<p>Keynote Speakers Location: Hall Styria Chair: Peter STURM, Graz University of Technology, AT</p> <p>9:25am - 9:45am Sustainability of tunnel operation: New approaches – a PIARC briefing note and collection of case studies René LIST, ASFINAG, AT</p>
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9:45am - 10:05am	<p>The Koralmtunnel as a real-world laboratory: Research work and findings during the construction of the Koralmtunnel Helmut STEINER, Austrian Federal Railways, AT</p>
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10:05am - 10:25am	<p>ASFINAG in case of a blackout – overview and measures Günter RATTEI, ASFINAG, AT</p>
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10:25am - 10:55am	Coffee Break - sponsored by Sohatsu Systems Laboratory Inc.
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10:55am - 12:10pm	<p>Session S1 Location: Hall Styria Chair: Ingo KAUNDINYA, BASt - Federal Highway Research Institute, DE</p> <p>10:55am - 11:20am Safe tunnels for smart vehicles: Challenges and opportunities of automated driving in road tunnels Regina SCHMIDT, ILF Consulting Engineers Austria GmbH, AT</p>
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11:20am - 11:45am	<p>Conformity bias influence to the walking speed in a smoke filled tunnel experiment Miho SEIKE, University of Tsukuba, JP</p>
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11:45am - 12:10pm	<p>Impact of group effects on the reaction and escape behaviour of users in road tunnels - results of realistic large group experiments Frank LEISMANN, STUVA e.V., Cologne, DE</p>
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12:10pm - 1:40pm	Lunch - kindly supported by the Governor of Styria Mario Kunasek
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Parallel Sessions

1:40pm - 2:55pm	<p>Session S2 Location: Hall Styria Chair: Bernhard KOHL, ILF Consulting Engineers Austria GmbH, AT</p> <p>1:40pm - 2:05pm Digital Twins for road tunnels – expectations meet reality Goetz VOLLMANN, Ruhr University Bochum, Institute for Tunnelling and Construction Management, DE</p>
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2:05pm - 2:30pm	<p>R&D project tunnelsensorfusion Dietmar HARBAUER, ASFINAG Alpenstraßen GmbH, AT</p>
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2:30pm - 2:55pm	<p>Development of a systematic approach for evaluation of the condition of the tunnel equipment Anne LEHAN, BASt, Federal Highway and Transport Research Institute, DE</p>
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1:40pm - 2:55pm	<p>Session G2 Location: Hall Graz Chair: Rune BRANDT, HBI Haerter AG, CH</p> <p>1:40pm - 2:05pm Methodology for the performance enhancement of longitudinal ventilation systems during transient stage of a fire Miguel DEL MORAL, Soler&Palau Ventilation Systems SLU, ES</p>
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2:05pm - 2:30pm	<p>Performance improvement of a hybrid ventilation system via predictive control Diego ANGELI, DISMI - University of Modena and Reggio Emilia, IT</p>
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2:30pm - 2:55pm	<p>Enhancements of tunnel ventilation system for road tunnels adopting aerodynamic control & monitoring strategies Ka Wing Kelvin CHEUNG, Building Engineering Group, AECOM (Asia) Company Limited, HK Anthony WAN, BYME Engineering (Hong Kong) Ltd., HK</p>
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2:55pm - 3:25pm	Coffee Break - sponsored by TROX Austria + CEE GmbH
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Parallel Sessions	
3:25pm - 5:05pm	<p>Session S3 Location: Hall Styria</p> <p>Chair: Simon FREY, HBI Haerter AG, CH</p> <p>3:25pm - 3:50pm Ventilation control optimisation for short longitudinally ventilated road tunnels in case of temporary bidirectional traffic operation Oliver HEGER, ILF Consulting Engineers Austria GmbH, AT</p>
	<p>3:50pm - 4:15pm External smoke movement and its impact on station design – Guidance for ventilation layout Jolyon THOMPSON, WSP UK Ltd, UK</p>
	<p>4:15pm - 4:40pm Safety challenges of highway lids in the US Petr POSPISIL, Tunnel Safety & Ventilation Consultant, US</p>
	<p>4:40pm - 5:05pm Cultural differences in road tunnel fire safety Conrad STACEY, Stacey Agnew Pty Ltd, AU</p>

Parallel Sessions	
3:25pm - 5:05pm	<p>Session G3 Location: Hall Graz</p> <p>Chair: Reinhard GERTL, ILF Consulting Engineers Austria GmbH, AT</p> <p>3:25pm - 3:50pm The best that FEDRO has provided us with in recent years! Experience from over 50 operating concepts for Swiss road tunnels Ralf WETZEL, ILF Beratende Ingenieure AG, CH</p>
	<p>3:50pm - 4:15pm Thrust comparison of conventional jet fans and fans with shaped silencers in an Italian road tunnel based on In-Situ measurements Fathi TARADA, Mosen Ltd, UK</p>
	<p>4:15pm - 4:40pm Optimization of the main fans and associated drives for the E4 Stockholm bypass Rune BRANDT, HBI Haerter AG, CH Peter STEVELINK, Zitron Nederland B.V., NL</p>
	<p>4:40pm - 5:05pm Experimental investigation of thermal runaway in lithium-ion batteries: Implications for tunnel safety and structural integrity Davide PAPURELLO, Department of Energy & Energy Center, Politecnico di Torino, IT</p>

5:05pm - 5:15pm	<p>Location: Hall Styria</p> <p>Informative presentation about the Technical Visit</p>
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7:30pm	<p>Conference Dinner Upon registration only! Departure from venue by bus 6:15pm</p>
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This event is supported by:



Austrian National Committee of the World Road Association

Conference Dinner

Tuesday, April 21, 2026 | 7:30 PM

Upon registration only!

Location:

Weinschloss Thaller

Maierhofbergen 24,
A-8263 Großwilfersdorf

<https://www.weinschloss-thaller.at>



Timeline:

6:15pm

Departure from venue by bus

7:00pm (approx.)

Arrival at the Weinschloss
Aperitif in the courtyard

7:30pm

Seated dinner

9:30pm

There is the option to take a glimpse into the barrel cellar with the local winemakers and to do some shopping afterwards at the local shop (Greißlerei).

10:30pm

Planned departure by bus
(arrival at Venue approx. 11:30pm)

Please let us know if you **DO NOT** require the included bus transfer!

Questions about the conference dinner?

e-mail: tunnel-graz@ivt.tugraz.at

phone: +43 (316) 873 - 30023

Exhibition - Participating Companies



Parallel Sessions	
8:45am - 10:00am	<p>Session S4 Location: Hall Styria</p> <p>Chair: Ignacio DEL REY, TYPESA Group, ES</p> <p>8:45am - 9:10am</p> <p>Smart tunnel in industry 5.0: Improving road tunnel resilience by dynamic risk analysis</p> <p>Alessandro FOCARACCI, Prometeoengineering.it S.r.l., IT</p>
	<p>9:10am - 9:35am</p> <p>Acceptance criteria for design of longitudinal ventilation systems in road tunnels: Theoretical framework</p> <p>Matteo PACHERA, Sweco, BE</p>
	<p>9:35am - 10:00am</p> <p>State of the art and lines of development for the Artu risk analysis software</p> <p>Rugiada SCOZZARI, Cantene s.r.l., IT</p>
8:45am - 10:00am	<p>Session G4 Location: Hall Graz</p> <p>Chair: Michael BEYER, Stacey Agnew Pty Ltd, AU</p> <p>8:45am - 9:10am</p> <p>Heat transmission between ground and tunnel air for different configurations and uses</p> <p>Juan Manuel SANZ SACRISTÁN, Sener Mobility SA, ES</p>
	<p>9:10am - 9:35am</p> <p>Enhancement of the dispersion of pollutants near a tunnel ending in a street canyon, a CFD case study</p> <p>Gabriel REMION, CETU, FR</p>
	<p>9:35am - 10:00am</p> <p>Smoke recirculation at road-tunnel portals</p> <p>Marco TOBLER, Amberg Engineering, CH</p>
10:00am - 10:30am	Coffee Break - sponsored by FVT mbH

Parallel Sessions	
10:30am - 11:45am	<p>Session S5 Location: Hall Styria</p> <p>Chair: Conrad STACEY, Stacey Agnew Pty Ltd, AU</p> <p>10:30am - 10:55am</p> <p>Application of low-tech and lean-tech concepts to road tunnels for greater energy efficiency</p> <p>Tristan REGNIER, Egis, FR</p>
	<p>10:55am - 11:20am</p> <p>Effects of contributing to decarbonization by model-based predictive ventilation control (MPVC) on expressways</p> <p>Hiroki UEDA, Nippon Expressway Research Institute Company Limited, JP</p>
	<p>11:20am - 11:45am</p> <p>Improving energy efficiency in road tunnels</p> <p>Lorenz KIRCHEBNER, crypta.sec conceptum GmbH, AT</p>
10:30am - 11:45am	<p>Session G5 Location: Hall Graz</p> <p>Chair: Miho SEIKE, University of Tsukuba, JP</p> <p>10:30am - 10:55am</p> <p>On smoke detection systems in road tunnels - a quantitative comparison</p> <p>Samuel GEHRIG, AFRY Switzerland AG, CH</p>
	<p>10:55am - 11:20am</p> <p>Ventilation system upgrade for Huguenot tunnel in South Africa</p> <p>Tiago MASSINGUE, The South African National Roads Agency SOC Ltd, ZA</p>
	<p>11:20am - 11:45am</p> <p>Web-SCADA: A web-based supervisory control and data acquisition platform for road tunnel safety in Japan</p> <p>Leon DICKEL, Sohatsu Systems Laboratory Inc., JP</p>
11:45am - 1:15pm	Lunch

Parallel Sessions	
1:15pm - 2:30pm	<p>Session S6 Location: Hall Styria Chair: Frédéric WAYMEL, Egis Group, FR</p> <p>1:15pm - 1:40pm Towards accurate tunnel fire simulations: Grid sensitivity and les model comparison in fire dynamics simulator Mahfuz SARWAR, Fire Rescue Victoria (FRV), Major Community Infrastructure Unit (MCIU), AU</p> <p>1:40pm - 2:05pm On the flow resistance of tunnel fires – validation by full-scale fire tests Ingo RIESS, Riess Ingenieur-GmbH, CH</p> <p>2:05pm - 2:30pm Effect of road tunnel fitout on smoke control Michael BEYER, Stacey Agnew Pty Ltd, AU</p>
	<p>Session G6 Location: Hall Graz Chair: Oliver HEGER, ILF Consulting Engineers Austria GmbH, AT</p> <p>1:15pm - 1:40pm Consequences from large EV fires in a tunnel - a DACH research activity Daniel FRUHWIRT, Graz University of Technology, Institute of Thermodynamics and Sustainable Propulsion Systems, AT</p> <p>1:40pm - 2:05pm Modeling airborne brake wear particle transport in subway systems: A line-scale framework Rodrigo HERRERO, Metro de Madrid (MdM), ES</p> <p>2:05pm - 2:30pm From motion to understanding: How deep learning enhances automatic incident detection Emmanuel MARCHAND, Citilog, FR</p>
	<p>2:30pm - 3:00pm Coffee Break - sponsored by Honeywell Austria Gesellschaft m.b.H.</p>

3:00pm - 4:15pm	<p>Session S7 Location: Hall Styria Chair: Peter STURM, Graz University of Technology, AT</p> <p>3:00pm - 3:25pm Influence of the tunnel cross-section on tunnel aerodynamics Verena LANGNER, Gruner GmbH Wien, AT</p> <p>3:25am - 3:50pm Air speeds near services on tunnel walls Mark GILBEY, WSP Ltd, UK</p> <p>3:50pm - 4:15pm Train-induced aerodynamic loads acting on installations of Granitztal tunnel Michael REITERER, REVOTEC, AT</p>
	<p>4:15pm - 4:25pm Closing Remarks Location: Hall Styria Michael BACHER, Conference Director, Graz University of Technology, AT</p>

This event is organized by:



Institute of
Thermodynamics and
Sustainable Propulsion
Systems



Forschungsgesellschaft für
Verbrennungskraftmaschinen



Graz
University of Technology

**From project to practice –
start of maintenance work on the Koralm Railway Tunnel**

As part of the technical visit, participants can look forward to an exclusive trip along a section of the new Koralm railway line from Graz to Klagenfurt. A special ÖBB train will take them from Graz Central Station to the newly built **Weststeiermark train station**, where they will be given a tour of the station and the Koralm Railway/Koralm Tunnel information park located there. The journey then continues through the Koralm Tunnel – one of the longest railway tunnels in the world and the longest in Austria – to Carinthia, where the **ÖBB maintenance base in St. Paul im Lavanttal** is located.

The ÖBB Facilities and Service Center (ASC) located there is responsible for the maintenance and repair of the Koralmbahn infrastructure and, above all, part of the Koralm Tunnel. The new, state-of-the-art **3rd generation tunnel rescue train** – also known as the **ServiceJet** – and the equally new **high-performance maintenance vehicles** can be viewed on site.

After a **joint snack** at the ASC base, the return journey will again be by train through the Koralm Tunnel to Graz.

departure: 8:15am

return: approx. 12:35pm

The train will not wait for anyone who is late, so please make sure you are there on time!



departure & return:

Graz central train station (Hauptbahnhof)

Europaplatz 4, 8020 Graz

Participation is at your own risk

This event is sponsored by:



- SAVE THE DATE -

14th International Conference

Tunnel Safety and Ventilation

May 9-10, 2028

Graz, Austria

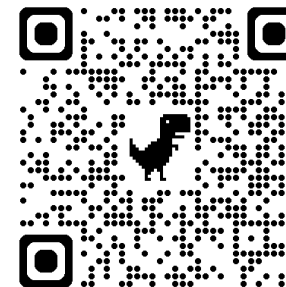


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TSV 2026 - Wifi

SSID: Tunnel Safety

Password: graz2026



TSV 2026 - Feedback

Let us know your opinion!

TSV 2026 - Proceedings

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