TIRE SOCIETY

40th Annual Meeting and Conference
on Tire Science & Technology
August 30th - September 3rd, 2021

2021 Conference Theme: The Virtual Tire

The virtual tire's role in vehicle development

The Tire Society welcomes interested individuals to its 40th Annual Tire Science and Technology Meeting and Conference - the scientific professional organization for the tire industry.

This annual meeting and conference is a forum for engineers, scientists, users, policymakers, students, and advocates to learn about innovations that will drive our industry in the years ahead. By effectively communicating our knowledge and research, we can influence practices and policies and inspire innovation at all levels. The conference will include:

- Technical Paper Presentations
- A Keynote Address
- Two Plenary Lectures
- Two Live Panel Discussions
- Networking Opportunities

Click here to register!

Invited Speakers

The Tire Society is excited to announce the participation of the following speakers during this year's annual meeting and conference!

Keynote Address

Mike Anderson – General Motors

Executive Director Global Virtual Design, Development, & Validation

Mike Anderson is currently the Executive Director of Global Virtual Design, Development & Validation at General Motors. In this role, he and his team are responsible for the computer-aided engineering (CAE) of every component, sub-system, and integration area of all current & future GM vehicles. He has held numerous positions during his 30 years at GM, including Executive Director of Global Transmission & Electrification Hardware, Executive Director of Global Engine Hardware, Global Chief Engineer and Program Manager of Four-cylinder Gas Engines, and Director of Engine Development & Validation. He is currently president-elect of FISITA, and a member of the Exascale Computing Project Industry Council. He holds a patent on engine variable valve lift control and has published on various powertrain technologies. He has also been an instructor on powertrain design & integration at the University of Michigan & the SAE Spark Ignition Engine Technology Engineering Academy. Anderson earned his Bachelor of Science degree in Mechanical Engineering from Purdue University, and a Master of Science degree in Mechanical Engineering from the University of Michigan.

Plenary Lecture

"Virtual Tires: Requirements, Fields of Application and Ways of Implementation"

Christian Oertel – Brandenburg University

Professor of Applied Sciences, Mechatronics

Dr. -Ing. Christian Oertel is a Professor at TH Brandenburg University of Applied Sciences, Mechatronics. He leads research and development teams in various industry and government sponsored research and development programs in collaboration with commercial software companies like T-Systems and IAT in Berlin. His areas of research include; tire mechanics including the development of the tire model family RMOD-K, vehicle system dynamics including tire models and full vehicle multibody simulations, tire testing and the tire property lab at TH Brandenburg, and virtual tire modelling including the development of a finite element and database based system. He earned his PhD at the Technical University of Berlin.

Plenary Lecture

"The Evolution of Engineering Tools and the Virtual World in Motorsports: A Personal Story"

Mike Stackpole – Stackpole Engineering Services
Founder & President

Michael Stackpole is the Founder and President of Stackpole Engineering Services based in North Canton, Ohio. He obtained his Master of Engineering Degree from the University of Akron in Akron, Ohio. Early in his career, he worked in various vehicle dynamics and tire modeling technical roles at both The Goodyear Tire & Rubber Company and Bridgestone/Firestone. There he developed expertise in the areas of tire/vehicle simulation development, tire testing and custom tire modeling. He established Stackpole Engineering Services over 20 years ago to further this expertise, providing engineering software solutions, tire testing, tire modeling and engineering services in support of OEM Vehicle and Tire Manufacturers and Professional Race Programs across the globe. With more than 30 years of career highlights on his resume, he has experienced first-hand the evolution of engineer tools and the virtual world throughout the sport of auto racing in Formula 1, NASCAR, SportsCar and IndyCar.

Panel Discussion

"Virtual Tire Submissions: Challenges from the Automotive Industry"

This panel discussion features users of virtual tire submissions from the automotive industry. In this panel, they will discuss topics such as:

- What are the drivers for virtual development? What is the virtual tire's contribution to that effort?
- What are the unmet needs in virtual tire submissions for current vehicle development?
- What will be the future requirements for virtual tire submissions?

Moderator:
Tom Ebbott – Goodyear Tire & Rubber Company

Panelists:
Greg Bunting – General Motors
Guenter Leister – TWMS Consulting
Jan Prins – Jaguar Land Rover
Madhu Rao – Tesla
Mario Weinberger – BMW

Panel Discussion

"The Next Chapter in Tire Model Technology"

This panel discussion features developers of tire model technologies. In this session, they will discuss the cutting edge technology being developed for modeling tire behavior for vehicle simulations. The topics for this discussion may include:

- Tire Thermal Modeling
- Tire Wear Modeling
- Tire Wet Modeling
- Tire NVH Modeling
- Snow / Soft Soil Modeling

Moderator:
Mike Stackpole – Stackpole Engineering Services

Panelists:
Flavio Farroni – MegaRide
Axel Gallrein – Fraunhofer ITWM
Michael Gipser – Cosin Scientific Software
Christian Oertel – Brandenburg University
Willem Versteden – Siemens Digital Industries Software

Technical Papers

	Paper Title	Authors	Author Affiliations
Emerging Technologies	Modal Coupling Analysis of Tire-Rim Assembly	Tan Li, Joe Shan, Christopher Lu	Maxxis Technology Center
	Design and Optimization of Tire Traction during lateral and longitudinal dynamics using Fuzzy Logic for Autonomous Vehicles	Dileepan Anandan, Kaushik Kumar Pruthvi Krishnamurthy	Hyundai Mobis Hinduja Tech
	An Algorithm for Estimating Tread Depth for Intelligent Tire Solutions	Tom Sams	Bridgestone Americas
Virtual Design	FTire - engineering a virtual tire	Michael Gipser, Joachim Stallmann, Bhaskar Chaturvedi, Swaroop Sharma	Cosin Scientific Software AG Continental Reifen Deutschland GmbH
	adheLAB: advanced calibration tool for a real-time MF-based multiphysical model	Martina Natiello, Vincenzo M. Arricale, Francesco Timpone	MegaRide Università degli Studi di Napoli Federico II
	Evaluation of Virtual Tire	Yi Li	Global Center for Automotive Performance Simulation
	Modeling and Simulation for Virtual Tire Development	Tom Ebbott	The Goodyear Tire & Rubber Co.

Technical Papers (continued)

Predictive Technologies	Tire Durability Prediction Using Three-Element Layered Mesh for Cord-Rubber Composites	Pooya Behroozinia, Bin Chung, and James Peters	Maxxis International USA
	Incremental, Critical Plane Analysis and Experimental Verification for TBR Tyre Bead Endurance Applications	Abhishek Nair, Durga Charan Mishra, Vidit Bansal, Sharad Goyal and William V. Mars	CEAT Tyres Endurica
	A Micro-sphere based Rubber Curing Model for Tire Production Simulation	Thomas Berger, Kim Sang-hyub, and Michael Kaliske	Technische Universität Dresden Hankook Tire
	A Model for Predicting Residual Casing Life of a Tire following an Impact Event	Gobi Gobinath, Tom Ebbott, Shannon Hughes	The Goodyear Tire & Rubber Co.
Tire-Road Interaction	A Comprehensive Model for Characterizing Rubber Wet Friction	Jonathan Watson, Thuy An Rue Art, Bin Chung, Tan Li, Robin Chung	Maxxis International USA
	Experimental investigation of the influence of snow density, temperature and moisture on the friction behavior of tire tread blocks	Michael Hindemith, Matthias Wangenheim	Institut for Dynamic and Vibrations Research
	"Target Tracking" Capture, Visualization and Quantification of the Tire Tread Movement Under Dynamic Conditions	Dr. Lin Kung, Savyasachi Gupta, Sean Liu	TMSI LLC
Tire Wear	Evaluating tire tread wear and its dependence on tire working conditions by using the Finite Element Method and Archard's wear theory	Heron J. Dionisio and Anderson M. Calhabeu	Prometeon Tyre Group
	On-Road Vehicle Measurements of Tire Wear Particle Emissions and Approach for Emission Prediction	M.Sc. Toni Feißel, Dr.-Ing. David Hesse, PD Dr.-Ing. habil. Valentin Ivanov, and Dr.-Ing. Sebastian Gramstat	Technische Universität Ilmenau Audi AG
	Investigation of wear of a tire tread block on a smooth friction surface in the discrete element method	Jonas Alexander Heidelberger, Matthias Wangenheim	Institut for Dynamic and Vibrations Research
	Active and semi-active suspension systems for minimising tyre wear in articulated vehicles	Georgios Papaioannou, Haoran Zhang, Jenny Jerrelind, and Lars Drugge	KTH Royal Institute of Technology
Tire and Vehicle System	"Mobility Ring" - A new concept for recovery of mobility after a tire breakdown	Prof. Dr. Günter Leister	TWMS Consulting
	Evaluation of Driving Simulator Technology for Ride & Comfort using a Physical Tire Model	Francesco Calabrese, Guido Tosolin, Javier Catalan, Manfred Bäcker, Axel Gallrein, Ivan Mula	Fraunhofer ITWM Applus+ IDIADA
	Parking specific parameterization method for FTire	Dominic Neumann, Jan Friederichs, Mark Harris, Mario Weinberger, Dr.-Ing. Christian Bachmann, Prof. Dr.-Ing. Dr. h.c. Dieter Schramm	BMW Group, RWTH Aachen University, fka GmbH, University Duisburg-Essen
	Virtual Modeling of Steering Rack Loads using Force and Moment Data	Bo Lin, Jason Wou James Cuttino, Michael Mulder	Ford Motor Company Link Engineering
	Methods for Improving Correlation between Indoor Tire Test Data and Full Vehicle Simulation and Testing	Marco Furlan, Mateo Gladstone, and Henning Olsson	Calspan Corporation
Student Papers	Tire multiphysical modelling for the analysis of thermal and wear sensitivity on vehicle objective dynamics and racing performances	Andrea Sammartino, Damiano Capra Flavio Farroni, Antonio Maiorano, Aleksandr Sakhnevych	MegaRide Università degli Studi di Napoli Federico II
	Analysis of off-road tire cornering characteristics using advanced analytical techniques	Fatemeh Gheshlaghi, Zeinab El-Sayegh, Moustafa El-Gindy Fredrik Ojjer, Inge Johansson	Ontario Tech University Volvo Group
	Correlation of snow tire traction with snow properties	Mohit Nitin Shenvi, Corina Sandu, Costin Untaroiu Eric Pierce	Virginia Tech Smithers
	Experimental friction analysis through innovative compound-substrate contact modelling for automotive applications	Vincenzo M. Arricale, Andrea Genovese, Antonio Maiorano, and Aleksandr Sakhnevych	Università degli Studi di Napoli Federico II
	Exponential decay of contact-patch friction steering moment with rolling speed	Jai Prakash, Michele Vignati, and Edoardo Sabbioni	Politecnico Di Milano
	VESevo, An Innovative Device For Non-Destructive And Smart Viscoelastic Characterization Of Tires Compounds	Carputo F., Genovese A. , Farroni F. , Maiorano A., Sakhnevych A., and Timpone F.	Università degli Studi di Napoli Federico II

Schedule

Time	Monday August 30	Tuesday August 31	Wednesday September 1	Thursday September 2	Friday September 3
8:00 AM 8:05 AM 8:10 AM 8:15 AM 8:20 AM 8:25 AM 8:30 AM 8:35 AM 8:40 AM 8:45 AM 8:50 AM 8:55 AM 9:00 AM 9:05 AM 9:10 AM 9:15 AM 9:20 AM 9:25 AM 9:30 AM 9:35 AM 9:40 AM 9:45 AM 9:50 AM 9:55 AM 10:00 AM 10:05 AM 10:10 AM 10:15 AM 10:20 AM 10:25 AM 10:30 AM 10:35 AM 10:40 AM 10:45 AM 10:50 AM 10:55 AM 11:00 AM 11:05 AM 11:10 AM 11:15 AM 11:20 AM 11:25 AM 11:30 AM 11:35 AM 11:40 AM 11:45 AM 11:50 AM 11:55 AM 12:00 PM 12:05 PM 12:10 PM 12:15 PM 12:20 PM 12:25 PM 12:30 PM 12:35 PM 12:40 PM 12:45 PM 12:50 PM 12:55 PM 1:00 PM 1:05 PM 1:10 PM 1:15 PM 1:20 PM 1:25 PM 1:30 PM	Conference Opening Keynote Address Mike Anderson - General Motors Break Emerging Technologies #1 Paper #1 Emerging Technologies #2 Paper #2 Emerging Technologies #3 Paper #3 Break Student #1 Paper #4 Student #2 Paper #5 Student #3 Paper #6 Break Sponsor Breakout Session	Student #4 Paper #7 Student #5 Paper #8 Student #6 Paper #9 Break Plenary Lecture #1 Christian Oertel Break Virtual Design #1 Paper #10 Virtual Design #1 Paper #11 Virtual Design #1 Paper #12 Virtual Design #1 Paper #13 Break Sponsor Breakout Session	Business Meeting Achievement Award Break Panel Discussion #1 "Virtual Tire Submissions: Challenges from the Automotive Industry" Break Predictive Technologies #1 Paper #14 Predictive Technologies #2 Paper #15 Predictive Technologies #3 Paper #16 Predictive Technologies #4 Paper #17 Break Sponsor Breakout Session	Tire-Road Interaction #1 Paper #18 Tire-Road Interaction #2 Paper #19 Tire-Road Interaction #3 Paper #20 Break Plenary Lecture #2 Mike Stackpole Break Tire Wear #1 Paper #21 Tire Wear #2 Paper #22 Tire Wear #3 Paper #23 Tire Wear #4 Paper #24 Break Sponsor Breakout Session	Tire & Vehicle System #1 Paper #25 Tire & Vehicle System #2 Paper #26 Tire & Vehicle System #3 Paper #27 Break Tire & Vehicle System #4 Paper #28 Tire & Vehicle System #5 Paper #29 Break Panel Discussion #2 "The Next Chapter in Tire Model Technology" 2022 Announcement Close of Conference Break Sponsor Breakout Session

Key

- Business Meeting Items
- Sponsor Breakout Session
- Invited Speakers / Panels
- Technical Session
- 40th Milestone Videos

Sponsors

The Tire Society thanks the financial contributions made by the following sponsors:

V-Rated Gold Sponsors

Endurica
Get Durability Right

COOPER TIRES

H-Rated Silver Sponsor

TMSI

LINK

T-Rated Bronze Sponsor

SMITHERS
INNOVATE WITH CONFIDENCE

Contact Information

For questions about the conference, please contact:

Matthew Schroeder
mjschroeder@coopertire.com
Program Chairman

Gobi Gobinath
gobi_gobinath@goodyear.com
Program Co-Chairman

For questions about The Tire Society, please contact our business office at tst@allenpress.com.