



NEWSLETTER

August 2023

Please forward our Tire Society newsletters to any colleagues and friends you think might be interested in learning more about the Tire Society and our mission to increase and disseminate knowledge of the science and technology of tires.

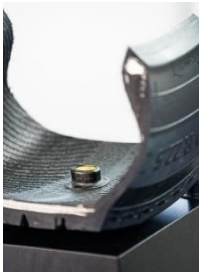
An Interview with 2023 Plenary Speakers: Dr. Burkhard Wies & Dr. Christian Lerner



Title: **“Challenges & Opportunities of Intelligent tires to support vehicle performance and Services”**

Dr. Burkhard Wies (*VP Innovation & Applied Research R&D*) and co-author Dr. Christian Lerner (*VP Connected Tire – Technologies & Analytics*) shared nuggets of wisdom on intelligent tires. This year’s plenary lecture will educate us and give a bird’s-eye view of the current state of intelligent tires.

1. *What are the key accomplishments (how far have we come along) in intelligent tires, since their inception?*



Since 30 years there has been several approaches besides simple identification (Tire RFID) to derive information or better sense tire- and vehicle-relevant load, pressure, temperature, potential puncture, aquaplaning, forces, grip and wear. All systems to directly integrate sensors in the tread area failed so far while attaching sensors to the inner part of the tire has been proven as a very good solution.

Nevertheless the application is so far limited to Commercial Vehicle Tires (CVT) and specialty tires but upcoming shared mobility and autonomous cars shows value as well in the

passenger car application. *But lowest overall driving costs (LODC) is the driving force for using Sensors inside the tire:* Offering proactive tire monitoring of fleets to determine, inflation pressure, temperature, load and wear state of Tires.

The third category of intelligent tires is based on clustering the information of all vehicle sensor & data and don't require any additional sensor in a tire but do predominantly use the ABS control signals to determine the pattern depth of tires or providing Aquaplaning warnings or friction level of the tire / road contact.

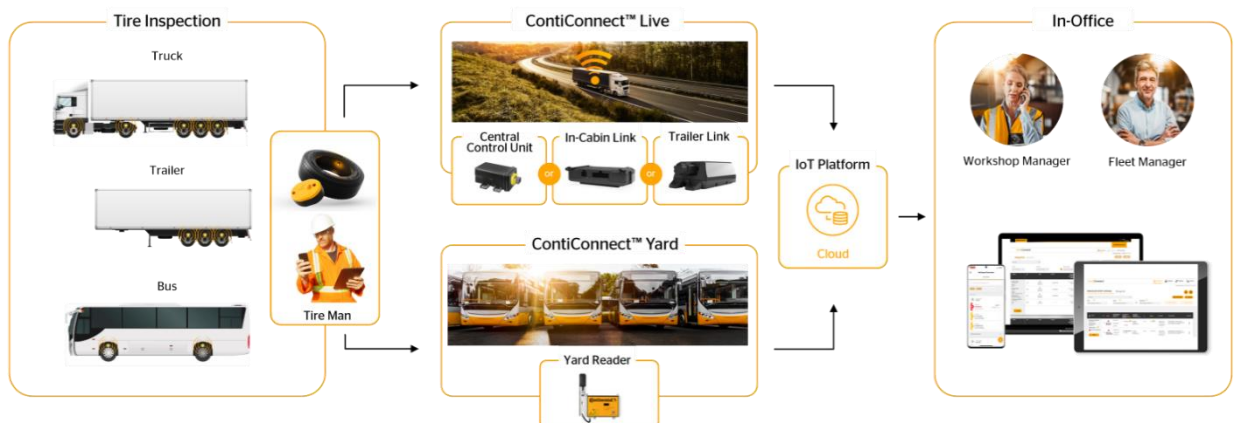
2. What are the current challenges we face in the estimation of load, wear, friction from intelligent tires?

The solution with sensors inside the tires has:

- i. Firstly, the challenge to develop an efficient method of application within the tire production process.
- ii. Secondly, the lifetime of the systems need to be in balance with the lifetime of the tires. The energy consumption needs to be optimized either by power supply with harvesting energy systems or by the overall system design

A vision for the future would be sending information directly to the backend to avoid additional Hardware on vehicle. On this way Yard Reader solutions (monitoring tire data of multiple vehicles that return to dedicated checkpoints on a regular basis vs live monitoring) do provide a solution to keep infrastructure cost under control for reading devices.

But in contrast to TPMS sensors mounted on a rim, *only the sensor applied on the inner part of the tire does allow precise online measurements of actual tire loading and pattern depth determination.*



3. *What is core information/idea you like to share with our audience at Tire Society Conference?*

Intelligent tires do offer specifically in the commercial tire business (Truck, Bus, Specialty) excellent opportunities for ensuring lowest overall driving cost via permanent tire status monitoring (inflation pressure, temperature, load and wear). But information like *friction level of the tire road contact can be much easily estimated via sensor fusion of all vehicle control algorithms* and thus in passenger car application intelligent tires won't be introduced. Some passenger/light truck OEM's are recently requesting RFIDs in tires to combine e.g. tire spec data like cornering coefficient vs. load behavior for adaptive programming of vehicle control systems.

In general, any sensor in a tire during a test run (endurance, wear...) offers great potential to further optimize tire design and improve efficiency of test methods thus ensuring reduced development times.

4. *Could you also discuss the role of finite element simulations and machine learning in development of intelligent tire algorithms?*

Finite Element Simulations are providing great insights into the tire. These tools are used during the design phase of a tire to optimize sensor performance (e.g., for perfect positioning of the RFID sensor within the bead area). Additionally, FE simulations provide a detailed characterization of the tire for each application. This massive amount of data can be utilized by machine learning algorithms. They are also used for signal analysis of raw data for optimization and correlation to e.g. pattern depth measurements for validation of the overall setup. More information about Continental's solutions can be found here:

<https://www.continental-tires.com/us/en/b2b/truck/solutions/digital-tire-monitoring.html>

Reflections from past Tire Society keynotes



The Tire Society's vision of sharing and disseminating tire knowledge resonates in the conference Keynote Addresses delivered by eminent industry leaders. In this edition, we are sharing thoughts that Michelin's CEO, François Michelin presented in his 1995 Tire Society Keynote Address. Michelin was well known for nurturing innovation, for his genuine interest in people, and for his unfettered confidence in human potential. We hope you feel inspired from Francis Michelin thoughts and ponder upon the problems in our hand (virtual tire submissions, intelligent tires, e-mobility etc.) and that they will encourage you to develop innovative solutions.

The ideas he shared are still relevant and directly questions us: *What's stopping us from innovating?*

- *If innovation is crucial to solving the biggest challenges, so what encourages discovery??*
- *Most new ideas that work are different from what people think and in opposition to current beliefs. And they are fragile, like a small child.*
- *What is the source of ideas?*
- *What is the definition of success, according to Francis Michelin?*

For the full content of his keynote address, [click here](#).

2023 Conference – Sep 12 - 13 @ University of Akron, Ohio



Keynote Speaker: David Johansen, *VP Technical, Sumitomo Rubber USA*



Plenary Speaker: Dr. Burkhard Wies, *VP Innovation & Applied Research R&D, Continental Tires*

Title: “**Challenges & Opportunities of Intelligent tires to support vehicle performance & Services**”



Title: “**Automotive Trends and the ‘Art of the Possible’ with Simulation**”

Banquet Speaker: Judy Curran, *Sr. Chief Technologist Automotive, ANSYS, Inc.*

[Registration is now Open!](#)

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Registration Type	Early Rates (through August 15, 2023)	Regular Rates (after August 15, 2023)
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Student Member Registration	\$130	\$190
Retiree Member Registration	\$160	\$220
Non-Member Reg w/ Online Only Membership	\$650	\$710
Non-Member Reg w/ Print and Online Membership	\$750	\$810
Student Non-Member Reg w/ Online Only Membership	\$155	\$215
Retiree Non-Member Reg w/ Online Only Membership	\$200	\$260
Member POD-Only Registration*	\$400	\$460
Non Member POD-Only Registration*	\$550	\$610

*video content will be made available 1-2 weeks after the in-person conference

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