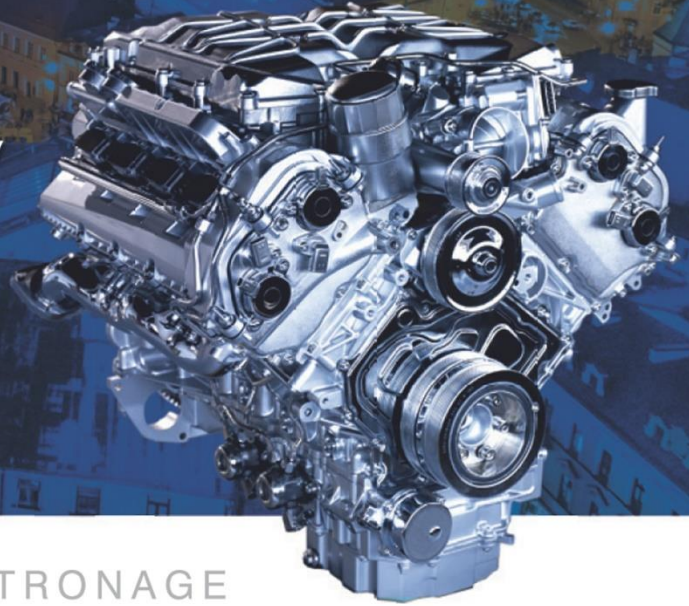




IX INTERNATIONAL CONGRESS ON COMBUSTION ENGINES

POLISH SCIENTIFIC SOCIETY OF COMBUSTION ENGINES

Lublin 27th-28th Sep. 2021



HONORARY PATRONAGE

PATRONAT HONOROWY
WOJEWODA LUBELSKI
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PREZYDENT MIASTA LUBLIN
KRZYSZTOF ŻUK

PATRONAT
HONOROWY



REKTOR POLITECHNIKI LUBELSKIEJ
PROF. DR HAB. INŻ. ZBIGNIEW PATER



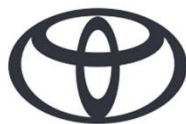
POLSKA AKADEMIA NAUK

Komitet Transportu
Polskiej Akademii Nauk

Komisja Nauk
Inżynierijno-Technicznych
PAN Oddział w Lublinie



SPONSORS



PROGRAMME

CONGRESS LOCATION

CONGRESS VENUE

The Eastern Innovation Centre of Architecture

Lublin University of Technology, Nadbystrzycka 40



OTHER VENUES

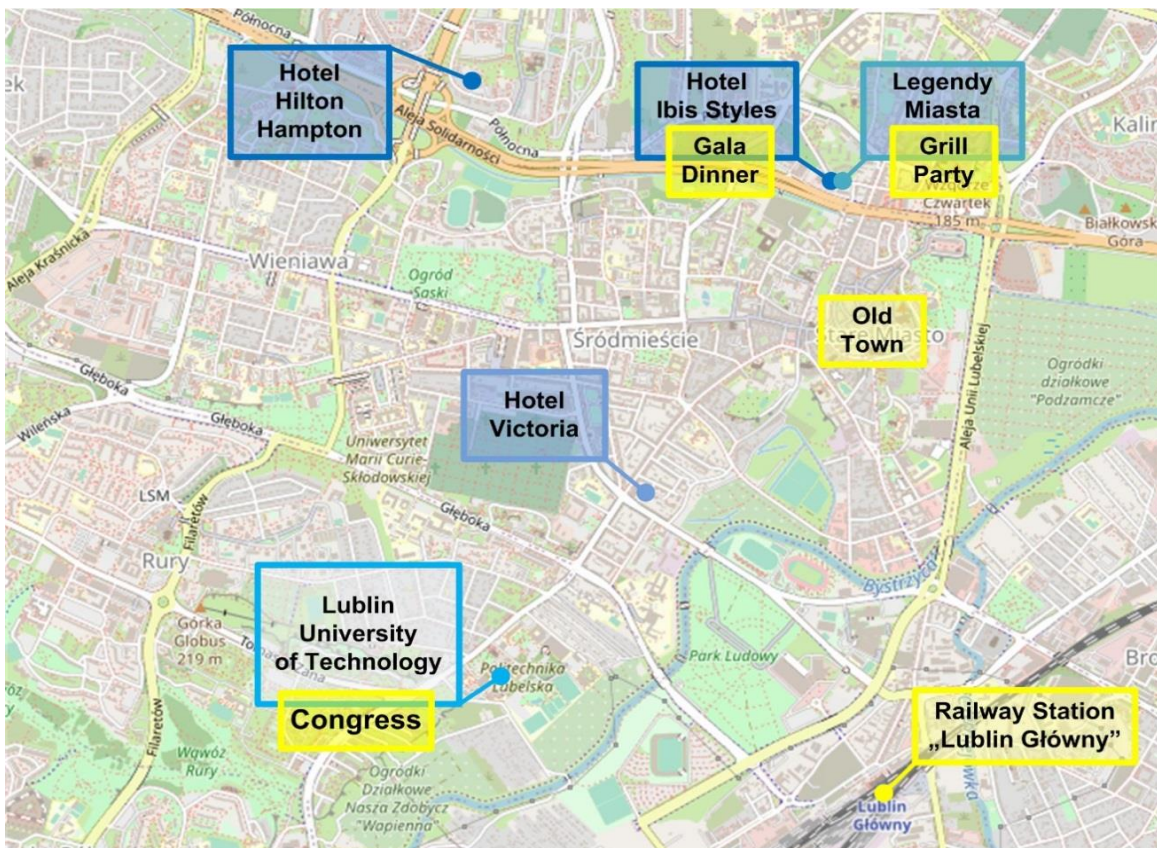
Welcome Reception on September 26th – hotel Ibis Styles Lublin Old City, Aleja Solidarności 7

Gala Dinner on September 27th – hotel Ibis Styles Lublin Old City, Aleja Solidarności 7

Barbecue (Grill Party) on September 28th – Legendy Miasta Restaurant, Aleja Solidarności 7

Lunches on September 27th and 28th – LanczoMania Restaurant, ul. Nadbystrzycka 40a

Visit to Lublin Old Town – start hotel Ibis Styles Lublin Old City, Aleja Solidarności 7



PTNSS 2021

Congress programme at a glance

26.09.2021 Sunday		27.09.2021 Monday		28.09.2021 Tuesday	
		8:00-9:00	Registration The Eastern Innovation Centre of Architecture in Lublin		
		9:00-9:30	Opening ceremony	9:00-11:00	Session 4 Powertrain electrification and new engine concepts
		9:30-11:15	Keynote 1 Session 1 Green Deal, Fit for 55 and Euro 7/VII influence on powertrains' development		
		11:15-11:45	Coffee break	11:00-11:30	Coffee break
		11:45-13:30	Keynote 2 Session 2 Green Deal, Fit for 55 and Euro 7/VII influence on powertrains' development	11:30-13:30	Session 5 Powertrain technology and fuel development for different applications
		13:30-14:30	Lunch LanczoMania	13:30-14:30	Lunch LanczoMania
16:00-18:30	Registration The Eastern Innovation Centre of Architecture in Lublin	14:30-16:30	Session 3 Advanced combustion and alternative fuels	14:30-16:50	Session 6 Powertrain technology and test method development
		16:30-17:30	Poster session	16:50-17:00	Closing ceremony
		17:30-19:00	Break	17:00-18:00	Break
19:00-21:00	Welcome Reception Hotel Ibis Styles, Aleja Solidarności 7	19:00-0:00	Gala Dinner Hotel Ibis Styles, Aleja Solidarności 7	18:00-19:30	Visit to Lublin Old Town
				20:00-0:00	Barbecue (Grill Party) Legendy Miasta Restaurant, Aleja Solidarności 7

Programme

Monday
9:00-9:30 **Opening Ceremony**

Monday
9:30-10:15 **Keynote 1**

Chair: Piotr Bielaczyc

Piotr Szymański
EC JRC Director, The Netherlands

The future of road transport in Europe. Environmental implications of automated, connected and low-carbon mobility

Monday
10:15-11:15 **Session 1**
 Green Deal, Fit for 55 and Euro 7/VII influence on powertrains' development

Piotr Bielaczyc,
 Joseph Woodburn
BOSMAL, Poland

Global trends in vehicular emissions legislation with a special focus on further stages (EU 7/VII and China 7/VII) - associated development of ICE/hybrid/EV powertrain technologies and testing methodologies for LD, HD and NRMM sectors

Barouch Giechaskiel
EC JRC, Italy

Current and future particle number regulations (virtual)

Monday
11:45-12:30 **Keynote 2**

Chair: Krzysztof Wislocki

Thomas Koch
Karlsruhe Institute of Technology, Germany

Vehicle technology paths towards low CO₂ emissions. Assessment of solutions. Potential of reFuels and political situation (virtual)

Monday
12:30-13:30 **Session 2**
 Green Deal, Fit for 55 and Euro 7/VII influence on powertrains' development

Kurt Engeljehringer
AVL, Austria

EU-7 challenge and how to master it

Phil Roberts, Steve Whelan
HORIBA MIRA, UK

A road to rig development methodology for whole vehicle RDE compliance: engine-in-the-loop replication and emulation (virtual)

Monday Session 3
14:30-16:30 Advanced combustion and alternative fuels

Chair: Paweł Fuć

<p>Liping Yang, Zhenting Liu, Jiaqi Wang, Yueying Zhu <i>Harbin Engineering University, China</i> Jacek Hunicz, Grzegorz Litak <i>Lublin University of Technology, Poland</i></p>	<p>Investigation on combustion and emissions of a marine diesel-natural gas RCCI engine (virtual)</p>
<p>Rafał Longwic, Przemysław Sander, Dawid Tatarynow <i>Lublin University of Technology, Poland</i></p>	<p>Ecological aspects of using mixtures of canola oil with n-hexane in diesel engine</p>
<p>Jacek Hunicz, Michał Gęca, Arkadiusz Rybak <i>Lublin University of Technology, Poland</i> Paweł Krzaczek <i>University of Life Sciences in Lublin, Poland</i> Maciej Mikulski <i>University of Vaasa, Finland</i></p>	<p>Dedicated engine calibration for partially premixed combustion of renewable fuels</p>
<p>Tomas Mickevicius, Gvidonas Labeckas, Stasys Slavinskas <i>Vytautas Magnus University, Lithuania</i></p>	<p>Experimental investigation biodiesel-n-butanol fuels blends on performance and emissions in the diesel engine</p>
<p>Andrzej Sobiesiak, Jeff Canape <i>University of Windsor, Canada</i></p>	<p>Performance of a small indirect-injection diesel engine with intermetallic thermal barrier coated pistons</p>
<p>Jacek Czarnigowski, Piotr Jakliński, Piotr Karpiński <i>Lublin University of Technology, Poland</i></p>	<p>Combustion in the large aircraft piston engine with a dual spark ignition system</p>

Tuesday Session 4
9:00-11:00 Powertrain electrification and new engine concepts

Chair: Mirosław Wendeker

<p>Hartwig Busch, Joschka Schaub <i>FEV, Germany</i></p>	<p>Tailored emission control concept for diesel-hybrid powertrains in the light commercial vehicle class</p>
<p>Andrzej Szalek <i>Toyota Motor Poland</i></p>	<p>Vehicle propulsion system development up to 2050</p>
<p>Kohei Nakashima <i>Meijo University, Japan</i></p>	<p>Influence of piston surface treatment on piston assembly friction in an eco-mileage vehicle engine (virtual)</p>
<p>Stanisław Szwaja <i>Częstochowa University of Technology, Poland</i></p>	<p>IC engine with Szymkowiak cycle and variable compression ratio</p>

Tuesday Session 5
11:30-13:30 Powertrain electrification and new engine concepts

Chair: Joseph Woodburn

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| <p>Maciej Mikulski
<i>University of Vaasa, Finland</i></p> | <p>Clean propulsion technologies – a Finnish response to tightening emission legislation in marine and off-road segments</p> |
| <p>Mirosław Wendeker
<i>Lublin University of Technology, Poland</i></p> | <p>Aircraft piston engines: development trends, challenges and opportunities</p> |
| <p>Joseph Woodburn
<i>BOSMAL, Poland</i></p> | <p>Role of ammonia as an SCR reagent, pollutant and potential engine fuel</p> |
| <p>Chris Kolodziej
<i>Argonne National Lab, USA</i></p> | <p>Summary of engines and fuels research in the United States (virtual)</p> |

Tuesday Session 6
14:30-16:50 Powertrain technology and test method development

Chair: Stanisław Szwaja

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| <p>Ashish Vashishtha,
<i>Institute of Technology Carlow, Ireland</i></p> | <p>Turbulent jet ignition of premixed methane air mixture with hydrogen enrichment (virtual)</p> |
| <p>Saana Hautala, Maciej Mikulski,
Emma Soderang, Xiaoguo Storm,
Seppo Niemi
<i>University of Vaasa, Finland</i></p> | <p>Towards a digital twin of a mid-speed marine engine: from detailed 1D engine model to real-time implementation on a target platform (virtual)</p> |
| <p>Krzysztof Górka, Bartosz Kaźmierski,
Łukasz Kapusta
<i>Warsaw University of Technology, Poland</i></p> | <p>Numerical analysis of the flow rig for UWS spray examination in exhaust system-relevant conditions</p> |
| <p>Mateusz Kmiec, Matthias Weber
<i>Roben Automotive, Poland</i>
Marcel Romijn
<i>Roben Automotive, The Netherlands</i>
Dave Mathews
<i>Roben Automotive, US</i></p> | <p>Application of automotive safety design methodologies to the development of Euro7 emission control systems including On Board monitoring</p> |
| <p>Piotr Wiśniowski, Anna Borucka,
Maciej Menes, Andrzej Świdorski
<i>Motor Transport Institute, Poland</i></p> | <p>Evaluation of the CO₂ emission from motor vehicles in the context of sustainable transport development</p> |
| <p>Aleksandra Kęska, Anna Janicka
<i>Wrocław University of Science and Technology, Poland</i></p> | <p>Evaluation of toxicity of hydrocarbons emitted by vehicles meeting Euro 3 and Euro 6 emission standards</p> |
| <p>Wojciech Cieślak
<i>Poznań University of Technology, Poland</i></p> | <p>Research capabilities of modern combustion systems</p> |

Poster Session

Monika Andrych-Zalewska, Jerzy Merkisz, Jacek Pielecha	The influence of the heating time of a catalyst-covered glow plug on the exhaust emissions from a diesel engine
Maciej Andrzejewski, Mateusz Nowak, Aleksandra Woch, Natalia Stefańska	Analysis of pollutant emissions and fuel consumption for the use of a multi-storey carpark
Karolina Batura, Marek Waligórski	Methodological basis of road acoustic researches
Michał Biały, Łukasz Grabowski, Bartłomiej Skórzyński, Grzegorz Barański, Adam Majczak	Analyzing mechanical vibrations of an aircraft opposed piston engine
Artur Bogdanowicz, Tomasz Kniaziewicz, Ryszard Zadrag	The emission of harmful compounds from the marine diesel engine fueled by a blend of n-butanol and marine fuel
Marek Brzeżański, Michał Mareczek, Marcin Noga	The concept of a maintenance-free drive-thru inspection station for commercial vehicles
Zbigniew Chmielewski	Assessment of the kinetics of changes in selected physicochemical indicators of engine oil in operation
Zbigniew Chmielewski	Cylinder liner wear as a function of selected physicochemical indicators of engine oil
Janusz Chojnowski, Mirosław Karczewski	The structure of Polish road transport (types of fuel system supplies in used road tractor units) in terms of selecting an engine for the development modern dual fuel diesel/CNG installation
Wojciech Cieślik, Filip Sz wajca, Krzysztof Wisłocki	Reverse engineering of research engine cylinder head
Janusz T. Cieśliński, Jan Krzyżak, Jacek Kropiwnicki, Zbigniew Kneba	Experiments on compression ignition engine powered by nano-fuels
Jerzy Cisek, Andrzej Borowski, Joanna Całkowska, Łukasz Wichary	Effect of nitrON® cetane-detergent additive to B7 fuel on energy parameters and exhaust gas composition of a 6Dg locomotive with a Caterpillar C27 engine
Jacek Czarnigowski, Daniel Rękas, Karol Ścisłowski, Michał Trendak, Krzysztof Skiba	Analysis of operating parameters of the aircraft piston engine in real operating conditions
Paweł Daszkiewicz, Maciej Andrzejewski, Marian Medwid, Patryk Urbański, Maksymilian Cierniewski, Aleksandra Woch, Natalia Stefańska	Analysis of the selection of chosen technical parameters of the powertrain system for a diesel-electric rail-road tractor
Tadeusz Dziubak, Leszek Bąkała	Problems of selecting filter partition in passenger car engine intake air filters
Joanna Faber, Krzysztof Brodzik, Marta Nycz	Understanding technical cleanliness: importance, assessment, maintenance

Poster Session

Mariusz Furmanek, Jacek Kropiwnicki	Stirling engines – the state of technology development and computational models
Michał Gęca, Gojmir Radica	Effect of compression ignition engine preheating on its performance under cold start conditions
Michał Głogowski	Four-stroke engine with pneumatic energy accumulator – simulations and experiments
Piotr Hołyszko, Dariusz Zieliński Andrzej Niewczas, Joanna Rymarz	A method for analyzing the power supply to auxiliary on-board equipment of a trolleybus through kinetic energy recuperation
Agata Jaroń, Grzegorz Sobecki, Anna Borucka	Assessment of the possibility of using nanomaterials as fuel additives for combustion engines
Artur Jaworski, Kazimierz Lejda	Effect of driving resistances on energy demand and exhaust emission in motor vehicles
Tomasz Kalociński	Modern trends in development of alternative powertrain systems for non- road machinery
Maciej Kalwara, Michał Kuźniar, Marek Orkisz	A rotating piston engine with electric generator in serial hybrid propulsion system for use in light aircraft
Michalina Kamińska, Maciej Andrzejewski, Paweł Daszkiewicz	Research of ecological indicators of two-way vehicle in stationary conditions
Michalina Kamińska, Daniel Kołodziejek, Natalia Szymlet, Paweł Fuć, Rafał Grzeszczyk	Measurement of rail vehicles exhaust emissions
Wojciech Karpiuk, Maciej Bajerlein, Marek Idzior, Rafał Smolec	Volumetric losses of the compression process in a hypocycloidal pump in the light of the gas desorption effect
Michał Kawalec, Witold Perkowski, Borys Łukasik, Piotr Wolański	Applications of the continuously rotating detonation to combustion engines and other systems
Andrzej Kaźmierczak	Team durability test of a 1.3 mw locomotive diesel engine with prototype piston rings
Bartosz Kaźmierski, Krzysztof Górka, Łukasz Kapusta	A conceptual design and numerical analysis of the mixerless urea-SCR system
Oleh Klyus, Przemysław Rajewski, Sergejus Lebedevas, Sławomir Olszowski	Determination of fuel atomization quality in compression ignition engines using acoustic emission signal
Zbigniew Kneba, Denys Stepanenko, Jacek Rudnicki	Numerical methodology for evaluation the combustion and emissions characteristics on WLTP in the light duty dual-fuel diesel vehicle
Miłosław Kozak, Kryger Tomasz, Piotr Siejka	Environmental analysis of the traffic closure on Piotrowo and Berdychowo streets in Poznań

Poster Session

Rafał Krakowski	Research on the effect of the effective microorganisms, silver solution and colloidal nanosilver addition on the engine oil base number (TBN)
Rafał Krakowski	Research on the effect of the effective microorganisms, silver solution and colloidal nanosilver addition on the engine oil acid number (TAN)
Paweł Krzaczek, Andrzej Bochniak	Analysis of the engine operating conditions in agricultural tractors used in transport
Kacper Kuta, Ebrahim Nadimi, Grzegorz Przybyła, Zbigniew Żmudka, Wojciech Adamczyk	Ammonia CI engine aftertreatment systems design and flow simulation
Piotr Laskowski, Magdalena Zimakowska-Laskowska, Damian Zasina, Marcin Wiatrak	Comparative analysis of the emissions of carbon dioxide and toxic substances emitted by vehicles with ICE compared to the equivalent emissions of BEV
Piotr Laskowski, Magdalena Zimakowska-Laskowska, Damian Zasina, Marcin Wiatrak	Modelling of the air pollutants' cold-start emissions depending on average vehicles' speed
Monika Magdziak-Tokłowicz, Anna Janicka, Maciej Zawiślak, Zbigniew Sroka, Radosław Włostowski, Radosław Zuber, Adriana Włóka, Aleksander Górniak, Kacper Ostrowski, Kacper Leśny	Research and development works on a new generation off-road vehicle for disabled users
Jarosław Mamala, Andrzej Bieniek, Krzysztof Prażnowski, Mariusz Graba, Krystian Hennek, Szymon Kołodziej, Bartosz Mazurek, Maciej Sproch	Evaluation of energy consumption in the acceleration process of a passenger car
Jarosław Mamala, Mariusz Graba, Andrzej Bieniek, Krzysztof Prażnowski, Krystian Hennek	Energy consumption of a passenger car with a hybrid powertrain in real traffic conditions
Jędrzej Matla, Kaźmierczak Andrzej	Method of verifying the emission level of the exhaust components of a special vehicle in relation to EURO standards in road conditions
Maciej Menes	Two decades of HEVs' (hybrid electric vehicle) market
Maciej Menes	Program initiatives of public authorities in the field of hydrogenation of the economy in a global perspective, as of the end of 2020
Mateusz Nowak	Calibration of micro-simulation model in assessment of passenger car exhaust emission during acceleration
Marek Orkisz, Karolina Pazura	Experimental determination of compressor map of the DGEN 380 engine compressor using the WESTT CS/BV turbine engine simulator

Poster Session

Ireneusz Pielecha, Maciej Sidorowicz	Effects of mixture formation strategies on combustion in dual-fuel engines - a review
Wojciech Poprawski, Mieczysław Struś	Efficiency of the diesel engine fuelled with the advanced biofuel Bioxdiesel
Grzegorz Przybyła, Łukasz Ziółkowski, Mateusz Buczak, Zbigniew Żmudka	The tests of micro CHP prototype with SI engine powered by LPG and natural gas
Józef Pszczółkowski	Description of acid battery operating parameters
Józef Pszczółkowski	The model for cylinder charge parameters during engine starting
Bartosz Puchałka, Borys Adamiak, Andrzej Szczotka	Impact of different fuels on the exhaust emission results and fuel consumption of a car with an engine of large displacement
Patrycja Puzdrowska	Application of the F-statistic of the Fisher-Snedecor distribution to analyze the significance of the effect of changes in the compression ratio of a diesel engine on the value of the specific enthalpy of the exhaust gas flow
Radosław Raczyński, Karol Ścisłowski, Mirosław Wendeker, Ksenia Siadkowska	An assessment of the transient operation effects on helicopter main rotor stability and power demand
Ksenia Siadkowska, Błażej Czajka, Karol Ścisłowski, Mirosław Wendeker	Analysis of propulsion units dedicated to test stands for aviation systems
Maciej Siedlecki, Jerzy Merkisz, Michał Dobrzyński, Kamil Kubiak	Impact of the use of comfort devices on the exhaust toxic compounds from a modern PC car with spark ignition engine
Lech Sitnik	Operational energy footprint of vehicle
Zbigniew Sroka, Srinath Prakash, Radosław Włostowski	Design of the turbocharger bearing arrangement to increase the overall efficiency of the combustion engine
Grzegorz Szamrej, Mirosław Karczewski, Janusz Chojnowski	A review of technical solutions for RCCI engines
Tomasz Szczepański, Paweł Dziedziak, Andrzej Niewczas, Marcin Ślęzak	Forecasting the vehicles failures based on vehicle inspection stations data analysis
Mateusz Szramowiat, Andrzej Szalek	Analysis of the operation of the hybrid drive system in the light of the proposed Euro7 standard
Natalia Szymlet, Michalina Kamińska, Piotr Lijewski, Łukasz Rymaniak, Przemysław Tutak	Use of toxicity indicators related to CO ₂ emissions in the ecological assessment of an two-wheel vehicle
Bartłomiej Urbański, Grzegorz Przybyła	Hybrid drivetrain systems 48V in rally cars

Poster Session

Jerzy Walentynowicz	The aircraft engines in the land vehicles
Grzegorz Wcisło, Agnieszka Leśniak, Bolesław Pracuch	An influence of the second generation biodiesel BBuE admixture to diesel fuel on parameters affecting the auto-ignition properties
Andrzej Wolff, Grzegorz Koszałka	Influence of engine load on piston ring pack operation of an automotive IC engine
Zbigniew Wolczyński	Examples of the use of the embedded systems for the long-term collection of slowly-changing parameters in the traction of a car
Zbigniew Wolczyński, Mikołaj Żak	SI engine fuel mixture type indicator and an assessment of its suitability of an economic driving style
Marek Wozniak, Gustavo Ozuna, Krzysztof Siczek	Problems with glow plug
Radosław Wróbel, Gustaw Sierzputowski, Piotr Haller, Veselin Mihaylov, Radostin Dimitrov	The vehicle driver safety prediction system
Marcin Zacharewicz, Tomasz Kniaziewicz	Model tests of a marine diesel engine powered by a fuel-alcohol mixture
Andrzej Ziółkowski, Paweł Fuć, Aleks Jagielski, Maciej Bednarek	Analysis of emissions and fuel consumption from forklifts by location of operation
Zbigniew Żmudka, Stefan Postrzednik	Improving the effective efficiency of a spark ignition engine through the use of a fully independent valve control system

FUTURE

FESTIVAL OF ENERGY IDEAS



Lublin supports Powertrains

Lublin University of Technology is the largest research center in eastern Poland for the development, simulation and testing of powertrain systems, their integration into the vehicle or aircraft.

The Faculty of Mechanical Engineering was awarded the highest scientific category A+ and consists of three Departments dealing with the powertrains:

- Department of Thermodynamics, Fluid Mechanics and Aviation Propulsion Systems
- Department of Sustainable Transport and Powertrains
- Department of Automotive Vehicles

