



Medjunarodni naučno-stručni skup  
**XXVI NAUKA I MOTORNA VOZILA**  
**SCIENCE AND MOTOR VEHICLES 2017**  
 JUMV International Automotive Conference

19 - 20 April 2017, Belgrade, Serbia



**Draft**  
**FINAL PROGRAMME**

**Automotive Engineering**  
**for**  
**Improved Safety**

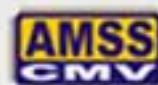


**Sponsors**

Institut Vinča



Centar za  
 motore i vozila



Patronage of **FISITA**

**Welcome to Belgrade**

Maintaining the tradition, JUMV is organizing the 26<sup>th</sup> International Automotive Conference **SCIENCE AND MOTOR VEHICLES** in Belgrade, on 19-20 April 2017 under the motto

**AUTOMOTIVE ENGINEERING FOR IMPROVED SAFETY**

with the special emphasis to mark 50 years since in 1967 the first forerunner event was held from which Automotive Conference "Science and Motor Vehicles" was generated having become an important international forum of Automotive Engineers in Serbia, Balkans and Central-Eastern Europe. It promotes the exchange of engineering and scientific knowledge and experience at the highest quality level between experts from different countries.

The 2017 conference will demonstrate continuity, tradition, and quality of 24 previously held conferences. It is an opportunity for participants to assess the development, applied automotive engineering expert scientific and engineering results with particular emphasis to improved safety.

This two day Conference will be held in English language consisting of the following sessions:

- AutoSim 2017 – Special Session on Simulation in Automotive Engineering
- Safety (Vehicle & Traffic Safety, Vehicle Safety Performance, Road Accident Reconstruction and Analyses, Vehicle Safety Regulations)
- Advanced Engineering Technologies & Tools

**Organization & Patronage Information**

26<sup>th</sup> JUMV International Automotive Conference SCIENCE AND MOTOR VEHICLES 2017 is organized by the JUMV – The Society of Automotive Engineers in Serbia. This event is organized under the Patronage of FISITA\* - International Federation of Automotive Engineers Societies.

\* FISITA is the international federation linking the national automotive engineering societies in 37 countries. FISITA was founded in 1948 as a neutral forum for the exchange of technical knowledge on every aspect of vehicle design, development and manufacture. FISITA is a non-profit organisation committed to helping create efficient, affordable, safe and sustainable automotive transportation. For further information on FISITA, including the full list of events organised or supported by the organisation please visit [www.fisita.com](http://www.fisita.com).

**International Programme Committee**

- [Prof. Dr. Jovan Todorović, (ret.) University of Belgrade & JUMV, Serbia]  
 Prof. Dr.-Ing. habil. Egon-Christian von Glasner, EVU, Germany  
 Dr. Matyas Matolcsy, GTE, Hungary  
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 Prof. Gianfranco Rizzo, University of Palermo, Italy  
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 Prof. Dr. Dušan Gruden, Germany  
 Mr. Alexander Berg, Dekra Automobile GmbH, Germany  
 Prof. Dr.-Ing. Sigmar Micke, Germany  
 Prof. Dr. Slavko Muždeka, Military Academy, Belgrade, Serbia  
 Mr. Aleksandar Grkić, Military Academy, Belgrade, Serbia  
 Prof. Dr. Cedimir Duboka, JUMV, Belgrade, Serbia

**Who should attend?**

Automotive engineers and scientists, Road traffic safety engineers, Accident reconstruction experts, Managers from automotive and supply industry, Academia associates, Governmental officers, Students and young engineers in automotive engineering and other related engineering sciences are invited to present results of their research, development and engineering work, and to take part at the Conference.

This Conference provides unique opportunities for participants to establish new professional and personal contacts, to exchange with other participants the results of their engineering activities, experience and expertise, and to learn more about automotive and supply industry in Serbia in order to open new business opportunities for their companies. Serbia is nowadays a country of challenges and opportunities for all those willing to extend their business to this part of Europe.

This Conference is also an opportunity for foreign participants to learn more about Serbia, and to enjoy the traditional hospitality of this part of Europe.

**Schedule of Sessions**

**Tuesday, 18 April 2017 @ 18h00 - Registration of participants with Welcome Drink**  
 @ Crowne Plaza Belgrade Hotel

**Wednesday, 19 April & Thursday, 29 April 2017 - International Conference**  
 @ Crowne Plaza Belgrade Hotel

The Conference Schedule will be as follows:

Date & Time	Wednesday	Thursday
	19 April 2017	20 April 2017
09h00	AutoSim 2017 (1)	Automotive Safety 2017 (1)
10h30	Coffee Break	
11h00	AutoSim 2017 (2)	Automotive Safety 2017 (2)
12h30	Coffee Break	
13h00	AutoSim 2017 (3)	Advanced Engineering Techniques & Tools (1)
14h30	Conference Lunch	
15h15	Free Time	Advanced Engineering Techniques & Tools (2)
		Conference Close
19h30	Conference Dinner	

**Language**

English Language will be the official Conference language.

**Conference Venues**

26<sup>th</sup> JUMV International Automotive Conference 2017 is hosted by Belgrade, the Capital of Serbia. The Conference venues will be Crowne Plaza Belgrade Hotel, 11070 Belgrade, V. Popovića 10, Phone (+38111)/2204-121, Email [nada.djukic@ihg.com](mailto:nada.djukic@ihg.com), [www.ihg.com/crowneplaza](http://www.ihg.com/crowneplaza).

# FINAL LIST OF PAPERS WITH CONFERENCE SCHEDULE

**Wednesday, 19 April 2017 @ 09H00**

## **SIMULATION IN AUTOMOTIVE TECHNOLOGY**

*Organized by Doz. Dr. Branislav Basara, AVL List GmbH, Graz, Austria*

- NMV17AutoSim-01**  
UNSTEADY RANS TURBULENCE MODELLING FOR INDUSTRIAL FLOWS: POTENTIAL AND HIDDEN SNARES  
Hanjalčić K., Delft University of Technology, HOL / Novosibirsk State University, RUSS
- NMV17AutoSim-02**  
NOVEL APPROACH FOR PREDICTING KNOCKING COMBUSTION IN GASOLINE ENGINES  
Frolov S.M., Ivanov V.S., Basevich V.Ya., Semenov Institute,RAS, Moscow, RUS, Basara B., Priesching P., AVL LIST GmbH, Graz, AUT
- NMV17AutoSim-03**  
COMPARATIVE ANALYSIS OF EFFICIENT SOLVER ALGORITHMS FOR THE HIGH FIDELITY SIMULATION OF TURBULENT INCOMPRESSIBLE FLOWS  
Jemcov A., Aerospace and Mechanical Engineering Department, University of Notre Dame, USA
- NMV17AutoSim-04**  
PREDICTION OF THE TURBULENT DISPERSION OF TRAFFIC-INDUCED REACTIVE SCALARS IN SIMPLIFIED - AND REAL-SCALE URBAN AREAS  
Kenjeres S. TU Delft, HOL
- NMV17AutoSim-05**  
RECENT EXPERIENCES OF PANS PREDICTIONS IN VEHICLE AERODINAMICS  
Krajinović S., Minelli G., Rao A., Chalmers University of Technology, Goeteborg, SWE
- NMV17AutoSim-06**  
ON COMPUTATIONAL CAR AERODYNAMICS  
Jakirlić, S., TU Darmstadt, GER
- NMV17AutoSim-07**  
RECENT ADVANCES IN CFD MODELLING OF AUTOMOTIVE FLOWS  
Basara, B., Žunić Z., Šarić S., Pavlović Z., Roredoš A., AVL List GmbH, Graz, AUT
- NMV17AutoSim-08**  
TOWARDS PREDICTIVE CFD SIMULATIONS FOR VEHICLE THERMAL MANAGEMENT  
Šarić S., Poredoš A., Basara B., Gomboc S., AVL List GmbH, Graz, AUT
- NMV17AutoSim-09**  
THERMAL-HYDRAULIC SIMULATIONS AS A SUPPORT TO THE DESIGN OF AUTOMOTIVE AIR CONDITIONING SYSTEM COMPONENTS  
Stevanović V., University of Belgrade, Faculty of Mechanical Engineering, SRB, Čučuz S., Rheinmetall Automotive Germany, GER
- NMV17AutoSim-10**  
DYNAMIC SIMULATION OF MULTI-PLATE CLUTCHES FOR AUTOMOTIVE APPLICATIONS  
Gradwohl Ch., Graz University of Technology, Belšak A., University of Maribor, SLO, Hirz M., Graz University of Technology, AUT
- NMV17AutoSim-11**  
MODELLING OF VEHICLE STEERING SYSTEM USING MULTIBODY SIMULATION  
Stojnić L., Khettou N., Grkić A., Muždeka S., University of Defence, Military Academy, Belgrade, SRB
- NMV17AutoSim-12**  
SIMULATION OF COUPLING CONDITIONS AND ENGAGING CAPABILITY OF DOG CLUTCH IN AUTOMATIC TRANSMISSIONS  
Neacsu E., Politechnica University of Bucharest, Bitica V., General Inspectorate of Romanian Border Police, Bucharest, and Banca Gh., Renault Technologie Roumanie, Titu, ROM

**Thursday, 20 April 2017 @ 09H00**

## **AUTOMOTIVE SAFETY**

*Chaired by Prof. Dr.G. Belingardi, DIMEAS, Politecnico di Torino, ITA*

- NMV17SAF-01**  
AUTOMATED DRIVING - Tasks, Possibilities, Gaps and Difficulties  
Matolcsy M., GTE, HUN
- NMV17SAF-02**  
AN AHP/TOPSIS METHOD FOR MEASUREMENT OF THE VEHICLE ROADWORTHINESS PERFORMANCE INDEX (VRWPI)  
Jakimovska K., Ss.Cyril and Methodius University of Skopje, Faculty of ME, MKD, Duboka Č., Independent Consultant, Belgrade, SRB
- NMV17SAF-03**  
FACTORS AFFECTING THE SAFETY OF MODERN VEHICLES  
Uzi Raz, Prof. P.Hd. P.Eng, The Israeli college for security and investigation, Petach-Tikva, ISR
- NMV17SAF-04**  
HCT - VEHICLE DIMENSIONING METHODS FOR A TRAFFIC SAFETY  
Tuutijärvi M.-T., Haataja M., University of Oulu, Dept. of Mechanical Engineering, FIN
- NMV17SAF-05**  
THE DEVELOPMENT OF ASSESSMENT TECHNOLOGIES FOR ADVANCED SAFETY VEHICLES IN KOREA  
EunDok Lee, JaeKon Shin, Yun Seog Hong, Korea Automobile Testing & Research Institute, ROK
- NMV17SAF-06**  
OPTIMAL DESIGN SOLUTION AMONG THE PARETO ALTERNATIVES FOR VEHICLE NONLINEAR SUSPENSION SYSTEM  
Koulocheris V. D, Papaioannou D. G., and Christodoulou D. A., Vehicles Laboratory, School of Mechanical Engineering, NTA, Athens, GRE
- NMV17SAF-07**  
EXPLORATION OF FIXED TANK VEHICLE ROLLOVER STABILITY  
Koulocheris V. D, Papaioannou D. G., Vossou C.G., Vehicles Laboratory, School of Mechanical Engineering, NTA, Athens, GRE
- NMV17SAF-08**  
FINITE ELEMENT STRESS ANALYSIS VS CALCULATION METHOD FOR THE CONSTRUCTION OF A METALLIC TANK USED FOR DANGEROUS GOODS TRANSPORTATION  
Koulocheris V. D, and Vossou C.G., Vehicles Laboratory, School of Mechanical Engineering, National Technical University of Athens, GRE
- NMV17SAF-09**  
IDENTIFICATION OF VEHICLE AND ROAD PARAMETERS TOWARDS TRAFFIC MODELLING IN NETWORK ENVIRONMENT  
Jordanoska V., Danev Da., Kostikj A., University "Ss. Cyril and Methodius" Faculty of Mechanical Engineering, Skopje, MKD
- NMV17SAF-10**  
STRUCTURAL OPTIMIZATION OF A COMPOSITE CRASH-BOX USING METAMODELING TECHNIQUES  
Boria S., University of Camerino, Obradović J., Torino, Belingardi G., DIMEAS, Politecnico di Torino, ITA
- NMV17SAF-11**  
DEVELOPMENT OF A CROSS FLOW THERMAL RIG FOR MEASURING BRAKE DISC COOLING CHARACTERISTICS  
Topouris S., Cranfield University, Steward D., Jaguar Land Rover, Tirović M., Cranfield University, UK
- NMV17SAF-12**  
REAL-TIME MONITORING OF FRICTION SURFACE TEMPERATURE IN AUTOMOTIVE DISC BRAKE  
Grkić A., Muždeka S., University of Defence, Military Academy, Duboka Č., Independent AFE Consultant, Belgrade, SRB
- NMV17SAF-13**  
FORENSIC EVIDENCE IN ROAD ACCIDENTS CAUSED BY VEHICLE'S MECHANICAL FAILURES  
Duboka Č., Independent AFE Consultant, Belgrade, SRB

**Thursday, 20 April 2017 @ 13H00**

## **ADVANCED ENGINEERING TECHNIQUES & TOOLS**

*Chaired by Dr. Miloš V. Milačić, Ford Motor Company, Detroit, USA*

- NMV17AETT-01**  
STATISTICAL PROFILING OF VEHICLE OFF-TIMES AS APPLIES ON FUEL CELL VEHICLES AT VARIOUS LOCATIONS  
Milačić V. M., Ford Motor Company, Detroit, USA.
- NMV17AETT-02**  
VEHICLES AND TRAFFIC STRUCTURE AS CORE ASPECTS TOWARDS INTRODUCING ELECTRIC VEHICLES IN REPUBLIC OF MACEDONIA  
Kjosevski S., University "Mother Teresa", Skopje, Kochov A., and Kostikj A., University "Ss. Cyril and Methodius", Faculty of Mechanical Engineering, Skopje, MKD
- NMV17AETT-03**  
APPLICATION OF THE LOGICAL-AND-PROBABILISTIC METHOD FOR THE PREDICTION OF VEHICLE OPERATION RELIABILITY  
Makarova I., Mukhametdinov E., Shubenkova K., Mavrin V., Kazan Federal University, Naberezhnye Chelny, RUS
- NMV17AETT-04**  
ALTERNATIVE FUEL BUSES SELECTION FOR PUBLIC TRANSPORT IN BELGRADE – A MCDM MODEL  
Momčilović V., Dimitrijević B., Stokić M., University of Belgrade - Faculty of Transport & Traffic Engrg, SRB
- NMV17AETT-08**  
DEVELOPMENT CONCEPT OF MILITARY ELECTRIC VEHICLE 8X8 WITH DYNAMIC CHARGING METHOD  
Veljović M., Živić D., City Bus Company Belgrade, Belgrade, SRB
- NMV17AETT-09**  
A ROLE OF INDUSTRIAL ROBOTS IN THE INCREASE OF PRODUCTIVITY IN THE AUTOMOTIVE INDUSTRY  
Karabegović I., University of Bihać, Technical Faculty, Bihać, BIH
- NMV17AETT-10**  
DYNAMIC LOAD OF VEHICLE'S POWER TRANSMISSION SYSTEM  
Damjanović M., Simović S., University of Montenegro, Faculty of Mechanical Engineering, Podgorica, MNE

### Important Dates

**15 February 2017** – Submission of final manuscripts  
**15 March 2017** - Registration Fee payment for Authors (Dead line)  
**15 March 2017** - Final Programme Issuing  
**01 April 2017** - Registration Fee payment for other participants  
**18 April 2017 @ 18h00** - Registration of participants and Welcome Drink  
**19 April 2017 @ 09h00** - Opening of the Conference

### Visa & Letters of Invitation

Majority of participants will be allowed to enter Republic of Serbia without visa. However, in order to avoid any misunderstandings, participants are kindly requested to visit <http://www.mfa.gov.rs/Consularaffairs.htm> for an updated information concerning the visa regime for those wishing to enter Serbia or to contact the nearest Consular Offices or Diplomatic Missions of the Republic of Serbia in their country. Upon request, JUMV will provide personal invitation letter to any participants after the registration fee was paid.

### Registration

Registration Fee includes Conference CD Proceedings, Admission to all Sessions, Conference Dinner, Welcome Drink, Refreshment at Coffee Breaks and Catered Luncheons. Standard Registration fee will be € 400.00 (VAT included, Bank handling cost not included). Early registration discount will apply for registration fee payment before 15th February 2017. Special discount will be granted to all former participants of the Conference. Upon request, special registration fee rates will be offered to students, young engineers, JUMV partners, etc. Walk-in to the conference will not be accepted. To register, please download and fill-in the Registration form from [www.nmv2017.jumv.rs](http://www.nmv2017.jumv.rs) or fill-in the enclosed Registration Form and mail/fax it to JUMV. Money Transfer details will be available upon request. Please mail the copy of payment document (SWIFT) to [cduboka@eunet.rs](mailto:cduboka@eunet.rs) / [cduboka@jumv.rs](mailto:cduboka@jumv.rs). Payment by Cheque to JUMV or Western Union Money Transfer will also be accepted.

### Advertising, Promotional & Sponsorship Opportunities

All authors, the companies from where they come and other companies are invited to benefit the Advertising, Promotional & Sponsorship Opportunities of this Conference, which are tailored to fit their individual needs. For more information please visit [www.nmv2017.jumv.rs](http://www.nmv2017.jumv.rs) or contact the JUMV by Phone, E-mail or Fax.

### Accommodation

Accommodation should be managed on the participants own. Crowne Plaza Belgrade Hotel offers special discount to the conference participants. While booking please make reference to JUMV Conference 2017! Otherwise, please use any standard booking possibilities like [booking.com](http://booking.com), [hotels.com](http://hotels.com) or [expedia.com](http://expedia.com).

### The history of the Science & Motor Vehicles Conference

FISITA recently granted patronage to the JUMV 2015 International Automotive Conference that was established in 1967 as a professional seminar organised at the Faculty of Mechanical Engineering in Belgrade, capital of the former Yugoslavia.

Founded by Dr. Jovan Todorović, Professor of Automotive Engineering and a former FISITA Vice President, the conference was initially organised in association with the R&D departments of main automotive component and vehicle manufacturers.

JUMV (the Yugoslav Society of Automotive Engineers) was later founded in October 1972 and soon became a FISITA Member Society, taking over organisation of the conference.

Beginning as a national conference with international participants, the conference quickly grew to become a truly international event, receiving significant contributions from the likes of Dr. Thomas Peter Newcomb, Guy Tidbury, Prof. Pal Michelberger, Prof. H. P. Lenz and many others.

This worldwide recognition coincided with the internal transformation of former Yugoslavia, and in 1986, Belgrade was the host city for the 21st FISITA World Automotive Congress, welcoming over 1,200

participants, the largest number of FISITA Congress attendees up to that time.

Despite great domestic challenges including political, economic and social crises leading to war, dissimulation and continued change in national name, size, and structure, the JUMV Conference has managed to survive. In April 2015, it will celebrate its 25th event.

Serbia is now a European Union candidate country and offers international investors great opportunities, particularly in the automotive engineering industry. Belgrade has become known both at home and abroad as the "capital of good life and spirit" offering all those who visit it a welcoming atmosphere and an ethos that looks towards the future.

The 25th Science and Motor Vehicles International Automotive Conference will take place from 14-15 April 2015 in Beograd, Belgrade.

Source: FISITA InsideTrack No. 18



1993



1995



1997



2003



2005 (X EAEC Congress)



2013

### Conference Sponsor 2017

Institute Vinča, Center for Engines and Vehicles, Belgrade  
Automotive Club of Serbia, Center for Motor Vehicles, Belgrade

"This event is organised under FISITA Patronage.

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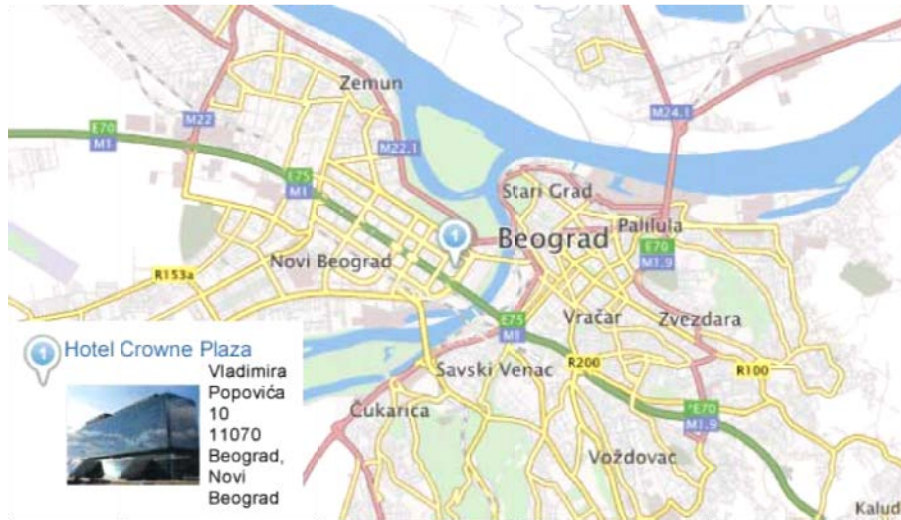
[www.fisita.com](http://www.fisita.com)"

### Conference Contact Information

JUMV (Prof. Dr. Č. Duboka), c/o Faculty of Mechanical Engineering \* SRB-11120 Belgrade 35, POB 34. Kraljice Marije 16, Serbia

Phone: (+381-11) 3340-762, 4058-229

E-mail: [cduboka@eunet.rs](mailto:cduboka@eunet.rs), [cduboka@jumv.rs](mailto:cduboka@jumv.rs), [cduboka@gmail.com](mailto:cduboka@gmail.com), [cduboka@mas.ba.ac.rs](mailto:cduboka@mas.ba.ac.rs), \* <http://www.nmv2017.jumv.rs>



Location of Crowne Plaza Beograd Hotel



Crowne Plaza Beograd Hotel



Mediteran Room



Floor Plan Mezanine

International Automotive Conference **JUMV** Medjunarodni naučno-stručni skup  
**XXVI NAUKA I MOTorna VOZILA**  
**SCIENCE AND MOTOR VEHICLES 2017**  
 19 - 20 April 2017, Beograd, Serbia

**REGISTRATION FORM**

Name: \_\_\_\_\_ First Name: \_\_\_\_\_ Title: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Department \_\_\_\_\_ Address: \_\_\_\_\_  
 City: \_\_\_\_\_ Zip: \_\_\_\_\_ Country: \_\_\_\_\_  
 Phone: \_\_\_\_\_, Fax \_\_\_\_\_, Email: \_\_\_\_\_

**Tick Category as appropriate:**

- Presenting author  Partner  
 Co-author & Delegate  Student  
 Conference Dinner at a price of 50 € per person

Arrival date: \_\_\_\_\_ Departure date: \_\_\_\_\_

Payment method preference:

- Bank Money transfer  Western Union Money transfer  Check

**Note : JUMV will confirm your registration details and provide you with the invoice and payment instructions within 48 hours upon receiving this Registration Form.**

I have read and understood the cancellation policy

Date & place, \_\_\_\_\_ Company stamp \_\_\_\_\_ Signature \_\_\_\_\_

**REGISTRATION CONDITIONS & CANCELLATION POLICY**

- This form is an official purchase order. JUMV regrets failing payment registration fee on the day of the Conference at the latest entry to the Conference will not be allowed.
- JUMV will confirm your registration details and provide you with the invoice and payment instructions within 48 hours upon receiving this Registration Form in order to enable you to benefit early registration discount.
- No charge for cancellations received before 15 March 2017. Cancellation received after 15 March 2017 will result in cancellation fee of 30% of registration fee. No refunds for cancellations after 1 April 2017. No charge for substitutions at any time.

Please fill-in and email it to [cduboka@sunet.rs](mailto:cduboka@sunet.rs) or [cduboka@jumv.rs](mailto:cduboka@jumv.rs)  
 JUMV will confirm your registration details and provide you with the invoice and payment instructions within 48 hours upon receiving this Registration Form.

[www.nmv2017.jumv.rs!](http://www.nmv2017.jumv.rs!)