

November 2-4, 2023

PROGRAM

ESFA 2023

ECONOMICITATEA, SIGURANȚA ȘI FIABILITATEA AUTOVEHICULELOR
ECONOMICITY, SAFETY AND RELIABILITY FOR MOTOR VEHICLES

The XXXIIIrd SIAR International Automotive and Transport Engineering Congress

**The Xth ESFA Congress hosted to the
National University of Science and Technology POLITEHNICA Bucharest**



www.siarcongress.eu



BOSCH

Tehnică pentru o viață



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AUTO ROMÂN



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ZAREA

WELCOME MESSAGE

Every year, the Congress organized by the Society of Automotive Engineers of Romania brings together engineers, researchers, educators, students - all passionate about vehicles.

They come with scientific papers, inventions and new ideas in the fields of automotive, environment and transport, in a high-quality scientific programme, giving those interested the opportunity:

- to discover the latest technical developments in the automotive industry,
- to participate in exhibitions, workshops, and last but not least,
- giving students the opportunity to participate in student competitions in the field of vehicle dynamics and computer-aided design.

These annual Congresses of the Society of Automotive Engineers of Romania have always been successful in igniting the desire of experts from a variety of fields (research, design, production, operation, etc.) to get together, all those who dream of a cleaner environment, a quieter life, peaceful days, honest, beautiful, sincere friendship...

The growth of the automobile industry is dependent on an ongoing process of innovation in light of the limits imposed by international agreements and regulations, worldwide competition and the globalization process.

One of the key components of the future evolution of human society will be the mobility of ideas, objects, and people, and the automotive sector plays a significant role in this. The ESFA 2023 International Congress recognizes the significance of addressing the present and future issues facing the automotive industry and seeks to discuss, debate and resolve them within an appropriate scientific framework, as evidenced by the participation of participants from the academic, business, social and public sectors from both domestic and international locations.

The host of the 33rd edition of the SIAR Congress is the National University of Science and Technology POLITEHNICA Bucharest, the largest university in Romania, with national and international recognition.

Let's all live the joy of being together!

Prof. PhD. Dipl. Eng. DHC Burnete Nicolae

SIAR President





National University of Science and Technology POLITEHNICA Bucharest is the oldest and most prestigious engineer school in Romania. Its traditions are related to the establishment, in 1818, by Gheorghe Lazăr, of the first higher technical school with teaching in Romanian, at the Saint Sava Abbey in Bucharest. In 1832, it was reorganized into the St. Sava College.

www.upb.ro



Automotive Engineering Department was founded in 1959 within the Faculty of Transports, from Polytechnic Institute of Bucharest. The department ensures the development of two bachelor's study programs and three master's study programs

www.autovehiculerutiere.pub.ro



Society of Automotive Engineers of Romania is the professional organization of automotive engineers, independent, non-profit legal entity, active member of FISITA (Fédération Internationale des Sociétés d'Ingénieurs des Techniques de l'Automobile – International Federation of Automotive Engineering Societies) and EAEC (European Automotive Engineers Cooperation).

www.siar.ro



ESFA congresses have been organized by the AR Department since 1981, being one of the scientific events with a high visibility among specialists in the field of Automotive Engineering. The ESFA congress is part of a series of SIAR, congresses that are organized annually, by rotation, in the universities that train engineers in the field of Automotive Engineering and in which there are sections with SIAR members.

www.siarcongress.eu

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Mihai BOLDIJAR – Managing Director, Robert Bosch, România

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Iloana COSTEA – Dean Faculty Transports, National University of Science and Technology POLITEHNICA Bucharest

Mihnea COSTOIU – Rector, National University of Science and Technology POLITEHNICA Bucharest

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Technical University of Cluj-Napoca

President of Scientific & Technical Committee

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SIAR General Secretary

Minu MITREA

„Ferdinand I” Military Technical Academy of Bucharest

Website Coordinator

Dinu COVACIU

Transilvania University of Braşov

Exhibition

Marius-Florin TOMA

Cristian-Alexandru RENŢEA

National University of Science and Technology POLITEHNICA Bucharest

Student Contests

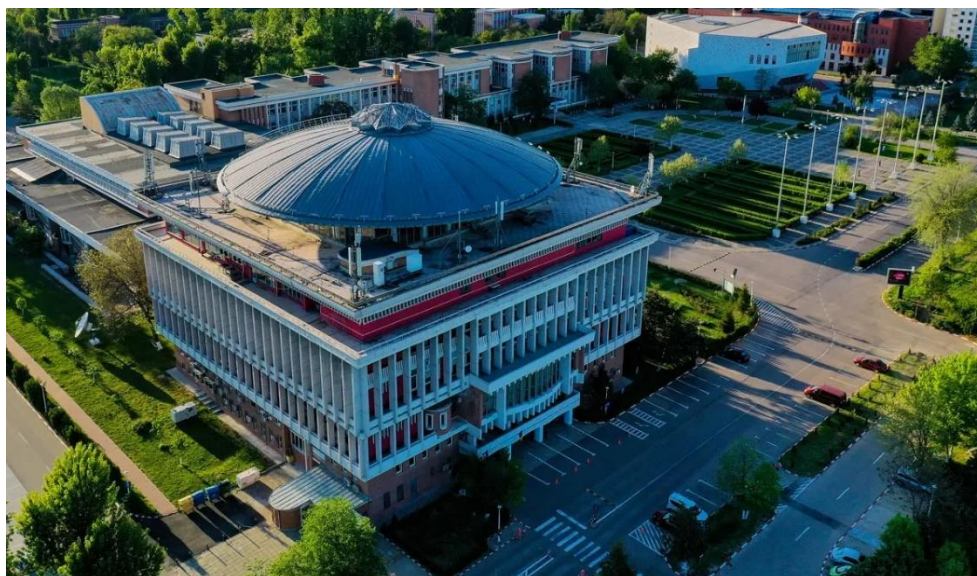
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National University of Science and Technology POLITEHNICA Bucharest - Rectorat

WEDNESDAY, 1st of November		
19:00	Welcoming Cocktail	Faculty Transports (J building)
THURSDAY, 2 nd of November		
08:00 – 09:00	Registration,	National University of Science and Technology POLITEHNICA Bucharest, Radu Voinea Amphitheatre (AN010)
09:30 - 10:00	Opening ceremony of ESFA 2023 Congress	
10:30 – 11:00	Coffee break	
11:00 – 13:00	Plenary Session: -Cornel STAN, West Saxon University of Zwickau, Germany « <i>Automobile of the future: a complex mobility system</i> » (on-line presentation) -Adrian-Constantin CLENCI, Pitești University Center -Ioan-Mircea OPREAN, Bucharest University Center National University of Science and Technology POLITEHNICA Bucharest, Romania « <i>The internal combustion engine in the context of sustainable road mobility</i> » -Stefan KANIA, AVL Austria « <i>Software-defined vehicle using thermal management as an example</i> » -Corina SANDU, Mechanical Engineering Department, Virginia Tech, USA « <i>Advances in mobility of autonomous vehicles in off-road conditions</i> » (video recording) -Robert BERCU and Marian POPESCU, FEV Romania, « <i>Euro 7 – Emissions & monitoring regulations – Future challenges</i> » -Ioana TIRCOMNICU UNGA, INAS, Romania « <i>Simulation in automotive: better, faster, cheaper</i> »	

13:00 – 14:00	Visit of the exhibition	Faculty Transports (J building)
14:00 – 15:00	Lunch	Central Library (4 th floor)
15:00 – 16:45	Oral presentations of scientific papers by sections	Faculty Transports (J building)
	Work-shop „Portable Emissions Measurement Systems (PEMS)” - Romanian Automotive Register – dedicated to students participating in the SIAR International Contest for Automotive Engineering Students “ <i>Professor Eng. Constantin GHIULAI</i> ”	
16:45 - 17:00	Coffee break (JC, 2 nd floor)	
17:00 – 19:00	Oral presentations of scientific papers by sections	
	SIAR Meeting The final stage of the SIAR International Contest for Automotive Engineering Students “ <i>Professor Eng. Constantin GHIULAI</i> ”: <i>Automotive CAD</i> section	
19:30	BOSCH Dinner, <i>Potcoava Restaurant</i> (near the entrance to the POLITEHNICA from Splaiul Independenței)	



National University of Science and Technology POLITEHNICA Bucharest - Central Library

FRIDAY, 3 rd of November		
09:00 - 11:00	Oral presentations of scientific papers by sections	Faculty Transports (J building)
	Meeting of students with the main sponsors and employers (Council Room)	
11:00 – 11:15	Coffee break (JC, 2 nd floor)	
11:15 – 13:15	Oral presentations of scientific papers by sections	
9:00 – 13:30	The final stage of the SIAR International Contest for Automotive Engineering Students “ <i>Professor Eng. Constantin GHIULAI</i> ”: <i>Vehicle Dynamics</i> section; <i>Automotive CAD</i> section	
14:00 – 15:00	Lunch	Central Library (4 th floor)
15:00 – 17:00	The final stage of the SIAR International Contest for Automotive Engineering Students “ <i>Professor Eng. Constantin GHIULAI</i> ”, <i>Automotive CAD</i> section	Faculty Transports (J building)
17:00 - 17:15	Coffee break (JC, 2 nd floor)	
17:15 – 18:15	Award ceremony of the students in the final stage of the SIAR International Contest for Automotive Engineering Students “ <i>Professor Eng. Constantin GHIULAI</i> ” and the Official closing ceremony of ESFA 2023 Congress (Council Room)	
18:30	Departure by bus for the Infoprodigital Dinner, in front of the Faculty Transport	
19:00	Infoprodigital Dinner, <i>Hard Rock Cafe Restaurant</i> (Herăstrău Park)	
SATURDAY, 4 th of November		
Free program / Documentary visits / Tourist visits		

THURSDAY, 2nd of November, 15:00 – 16:45

***Terrain vehicles
New materials and technologies***

Chairmen: **Marin-Stelian MARINESCU**, „Ferdinand I” Military Technical Academy of Bucharest

Marius-Florin TOMA, National University of Science and Technology POLITEHNICA Bucharest

Room: JD 014 (Castrol Laboratory)

#379	Overview on all-terrain vehicles, buggies and light electric vehicles D. Antonescu, D.A. Micu, O. Antonescu, F. Gaspar
#404	Tyre and rim dimensions through statistical estimation G. Anghelache, T. Ciobotaru
#412	Comparative analysis of FEM tire-soft snow interaction and theoretical model based on Bekker's Coefficients Y Surkutwarl, A. Vilsan, C. Sandu, C. Untaroiu
#475	Determining the mechanical characteristics of some tensile specimens, depending on the material and the printing position C. Babiş, A. Dimitrescu, S.A. Fica, C Stochioiu, D. Vlăsceanu, F. Baci, O.R. Chivu, I.C. Enache
#476	Comparison between gas flame welding and shielded gas welding in case of aluminium alloys C. Babiş, A. Dimitrescu, A.D. Rujinski, A.M. Rugescu, O.R. Chivu, I.C. Enache
#477	Comparisons between Assembly Technologies by Welding and Brazing of Aluminium Alloys from the Sight of Assembly Quality A. Dimitrescu, C. Babiş, A. Dumitrache-Rujinski
#478	Theoretical and experimental research on the mechanical tests of 3D printed samples from various materials A. Dimitrescu, C. Babiş, S. A. Fica, C. Stochioiu, D. Vlăsceanu and F. Baci

<i>Fuel economy and pollution control</i>	
Chairmen: <i>Nicolae ISPAS</i> , Transilvania University of Braşov <i>Cristian-Nikolaos NUTU</i> , National University of Science and Technology POLITEHNICA Bucharest	
Room: JD 013 (BOSCH 1 Laboratory)	
#371	An analysis comparing fuel consumption and CO₂ emissions of vehicles with conventional and hybrid propulsion under different driving cycles M.V. Pampa, C. Cofaru, S. Radu
#383	On the influence of different alcohol-type biofuels on performance and engine emissions of an SI engine R. Conţiu, R. Chiriac
#397	Experimental research on vehicles equipped with a GMP Hybrid for the new Euro 7 emissions standard G. Bancă F. Ivan, M. Toma, V. Nişulescu, D.A. Micu
#401	An estimation of the energy consumption of electric, hybrid and classic road vehicles starting from the equivalent WLTP driving cycles M.V. Pampa, N. Ispas, C.Cofaru, M. Năstăsoiu, C. Niţoiu
#405	On the impact of using nanoparticles type additives on the altering of diesel fuel jet characteristics A.L. Niculae, R. Chiriac, A. Racovitza
#457	Aerodynamic means of reducing the influence of warning accessories on drag and emissions, for intervention vehicles L.Ilea, C. Stan, M. Vieru
#460	The impact of real driving on vehicle CO₂ emission C. Constantin, M. Băţăuş, C. Renţea, G. Frăţilă
#462	Biogas from wastewater's sludge as potential resource for transportation. Experimental approach T.B.Bacos, A.E. Cioabla, F. Popescu, T. Vintilă, A.T. Borborean
<i>Traffic and road transport systems</i>	
Chairmen: <i>Vasile Dragu</i> , National University of Science and Technology POLITEHNICA Bucharest <i>Alexandru Boroiu</i> , National University of Science and Technology POLITEHNICA Bucharest, Piteşti University Center	
Room: JE 204	
#367	Consideration on traffic management in isolated intersections V. Dragu, F.C. Oprea, E.A. Roman

#391	The influences of human factors on road accidents in Romania in period 2013 - 2022 C.I. Dimitriu, G. Frățilă
#395	Theoretical study regarding the possibility of implementing a modern urban transport system in Bucharest, Romania A. Dobre
#398	Methodology for assessing the road traffic risk in urban areas D. Costescu, C.R. Bujor, A.M. Ifrim
#409	Research on the influence of traffic conditions on noise level in the passenger compartment of motor vehicles G. Neamțu, A.M. Țițu, A.A. Boroiu, A. Boroiu
#410	Mathematical Modeling of the Normal Fuel Consumption of Certain Vehicles A.M. Țițu, G. Neamțu, I. Țincu, A. Boroiu
#456	Road infrastructure safety assessment using the integrated method – case study DN2 C.I. Dimitriu, G. Frățilă
THURSDAY, 2nd of November, 17:00 – 19:00	
<i>Advanced powertrains</i>	
Chairmen: <i>Mircea NĂSTĂSOIU</i> , Transilvania University of Brașov <i>Marius-Valentin BĂȚĂUȘ</i> , National University of Science and Technology POLITEHNICA Bucharest	
Room: JD 014 (Castrol Laboratory)	
#355	Overview of the use of oxygen sensors in automotive applications D. Tutunea, I. Dumitru, O.V. Stănciuc-Oțăt
#366	Kinematic and dynamic analysis of a planetary gear box in steady-state working regime T. Ciobotaru, L.S. Grigore, L. Barothi, O. Alexa
#368	Aspects of combustion in diesel engine at hydrogen use – a theoretical approach A. Cernat, N. Negurescu, C. Pană, C. Nuțu
#376	Aspects of combustion variability analysis at an automotive engine fuelled with hydrogen R. Georgescu, C. Pană, N. Negurescu, A. Cernat, C. Nuțu, C. Sandu
#393	Design of advanced power transmission P. Pavlov, A. Dobreva

#427	Hydrogen fuelling a passenger car spark ignition engine for a cleaner environment C. Nuțu, C. Pană, N. Negurescu, A. Cernat, R. Georgescu
#464	The effect of LPG use over the performance of a Diesel engine C.V. Molnar, S. Izvorean, A.T. Borborean, V. Stoica
#469	Analysis of metal content in the lubricating oils used in truck diesel engines R. Niculescu, M. Năstase, D. Negrea, C. Zaharia, A. Clenci
<i>Vehicle design and testing</i> <i>Traffic and road transport systems</i>	
Chairmen: <i>Istvan BARABAS</i> , Technical University of Cluj-Napoca <i>Ștefan VOLOACĂ</i> , National University of Science and Technology POLITEHNICA Bucharest	
Room: JD 013 (BOSCH 1 Laboratory)	
#377	Kinematic analysis of the windshield wiper mechanism with two parallel rocker blades O. Antonescu, D. Antonescu, A. Ioniță
#378	Contribution to the syntesis of the windshield wiper mechanism with one rocker-slider blade O. Antonescu, D. Antonescu, A. Ioniță
#385	Analysis of different dimensions of a virtual wind tunnel and different wal conditions E.M. Vieru, M.D. Iozsa, A.M. Manea, L. Ilea
#386	Analysis of the aerodynamic performance of truck semi-trailers E.M. Vieru, C. Stan, L. Ilea
#473	An analysis of emissions and carbon footprints for the various types of vehicle propulsion B. Florescu, A. Oprica , M. Bică, I. Dumitru, D. Tutunea, N.G. Gencărau, L. Racila
#479	Evaluation of different vehicle types by using modelling algorithms in road traffic virtual networks platforms N.D. Gencărau, L. Matei, I. Dumitru, O.V. Stănciuc-Oță, M. Racilă, A. Oprica, L. Racila
#483	Particularities regarding the design and conception of a bodywork superstructure intended for the transportation of perishable goods H. Beles, F.B. Scurt, B. A. Tolea, T. Mitran, V. I. Tent

Green vehicles	
Chairmen: Grigore DANCIU , National University of Science and Technology POLITEHNICA Bucharest Viorel NICOLAE , National University of Science and Technology POLITEHNICA Bucharest, Pitești University Center	
Room: JE 204	
#357	Experimental research regarding the autonomy of electric cars in real driving conditions V. Nișulescu, F. Ivan, M. Toma, G. Bancă, C. Rența
#358	Considerations on reducing emissions by increasing the use of electric vehicles in urban area A. Vilcan, V. Nicolae, I. Martin, M. Istrate
#359	Research concerning the autonomy of the electric vehicles, simulated and measured, in the case of driving at the low and the medium speed, specific to the WLTC test C. Mînzatu, V. Nișulescu, M. Toma, C. Rența
#360	Research concerning the autonomy of the electric vehicles, simulated and measured, in the case of driving at the high and the very high speed, specific to the WLTC test C. Mînzatu, V. Nișulescu, G. Frățilă, C. Stan, G. Bancă
#364	Review of PEDELECS as an alternative to conventional means of urban transportation V. Teodorașcu, N.V. Burnete, N. Burnete
#380	Analysis of Energetic and Traction Performances for an Electric Vehicle in the Real Driving Conditions A.A. Ancuța, Ș. Voloacă, G. Frățilă
#402	Equalizing the battery charges of rechargeable accumulators O.I. Petrov
#421	A Duster Plug-in Hybrid Electric Vehicle with Wireless Charging System D.G. Marinescu, A. Marinescu, V. Nicolae, L. Calin, S. Parlac, I. Vieru, A. Stan

FRIDAY, 3rd of November, 09:00 – 11:00	
Vehicle dynamics, safety and comfort	
Chairmen: <i>Gabriel ANGHELACHE</i> , National University of Science and Technology POLITEHNICA Bucharest <i>Dragoş-Sorin DIMA</i> , Transilvania University of Braşov	
Room: JD 014 (Castrol Laboratory)	
#394	Dummy kinematics in frontal impact, comparison of simulations in Madymo with sled tests C. Nedeleşcu, A. Chiru, P. Vrabie, D. Truscă
#420	Numerical analysis and evaluation of a semi-heavy guardrail system M.I. Gheres, N. Cordos, A. Todorut
#450	Dynamic model for an independent suspension D. Popa, C.M. Popa, S. Marcu
#451	Dynamic system for the study of jumping vibrations of a car with active suspension model for an independent suspension D. Popa, C.M. Popa, S. Marcu
#468	Seat belt modelling and testing through virtual prototyping O.V. Stănciuc-Oţăţ, I. Dumitru, D. Tutunea, B. Florescu
#481	Possibilities to evaluate the vehicle's accelerations through MATLAB Simulink simulations I. Duma, A. Molea, N. Cordoş, H. Cărauşan, N. Burnete, I. Barabás, A. Todoruţ, B.M. Jurchiş
Advanced engineering methods and tools Green and smart vehicles	
Chairmen: <i>Helene SUSTER</i> , National University of Science and Technology POLITEHNICA Bucharest, Piteşti University Center <i>Ilie DUMITRU</i> , University of Craiova	
Room: JD 013 (BOSCH 1 Laboratory)	
#435	Surface defects vibration measurements of automotive tapered roller bearings B.A. Sabo, Ş. Voloacă
#436	Analytical study of the thermal comfort of the occupants inside a truck cabin A.M. Manea, M.D. Iozsa, E.M. Vieru
#466	Finite element analysis and experimental study of strain for a vehicle rear suspension I.D. Geonea

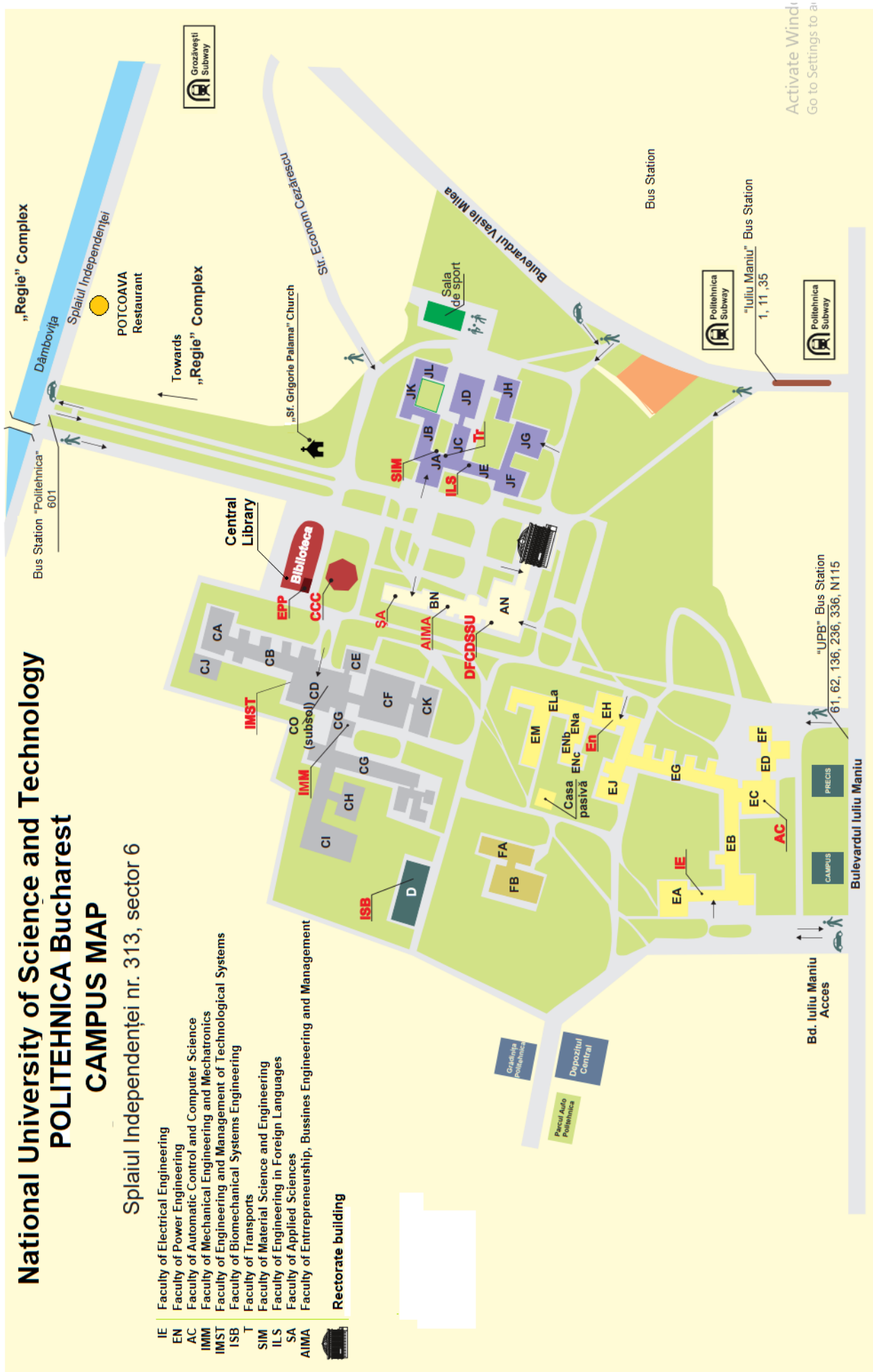
#430	The design and development of an Integrated Propulsion System – Phase 1: the wheel architecture V. Croitorescu, D. Preda, L. Giurca
#431	The design and development of an Integrated Propulsion System – Phase 2: the functional electric behavior strategy V. Croitorescu, B. Duran, L. Giurca
#432	The design and development of an Integrated Propulsion System – Phase 3: the testing bench V. Croitorescu, E. Ionescu, D. Preda, B. Duran, L. Giurca
#480	Proposed solution for the electrification of a motor vehicle formerly powered by an internal combustion engine (case study: Olcit) L. Racila, I. Dumitru, A. Oprica, L. Matei
#482	Assessment Possibilities for Trajectory Fusion of Two Vehicles in the Case of Automated Vehicles N. Cordoş, I. Barabás, A. Todoruț, I. Duma, A. Molea, D. Moldovan, N. Burnete, M. Jurchiș, M. Ghereș

National University of Science and Technology POLITEHNICA Bucharest CAMPUS MAP

Splaiul Independenței nr. 313, sector 6

- IE Faculty of Electrical Engineering
- EN Faculty of Power Engineering
- AC Faculty of Automatic Control and Computer Science
- IMM Faculty of Mechanical Engineering and Mechatronics
- IMST Faculty of Engineering and Management of Technological Systems
- ISB Faculty of Biomechanical Systems Engineering
- T Faculty of Transports
- SIM Faculty of Material Science and Engineering
- ILS Faculty of Engineering in Foreign Languages
- SA Faculty of Applied Sciences
- AIMA Faculty of Entrepreneurship, Business Engineering and Management

Rectorate building



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