**Full Professor Petre-Marian Nicolae, PhD. Eng.,** ***senior IEEE member,*** received the bachelor's in electrical engineering from the University of Craiova, and the Ph.D. degree in Electrical Engineering from "Politehnica" University, Bucharest. He authored eleven books, and more than 350 peer-reviewed papers. He is author of two patents as the first author. He held numerous chair positions at University of Craiova, as well as IEEE EMC Society Technical Committee 7. He has worked on power quality, electromagnetic compatibility, power converters for power systems and transportation, superconductivity, advanced design optimization, and applied mathematics in electrical engineering. He worked on 69 scientific research contracts. He coordinated as Project Director 43 research themes. He received the Romanian Academy Prize in 2000 and the Romanian Engineers Association Prize in 1998. He and his team were awarded the "Prize for Excellence in Scientific Research" by the National Authority for Research from 2005 to 2007. In 2012, he earned the John Howard Memorial University Grant Award from the IEEE EMC Society. The IEEE Power and Energy Society honoured him with the "Outstanding Engineer Award" in 2020 for his contributions to power quality concepts.

**Assistant Professor Iurie Nuca, PhD Eng.**, received bachelor's in electrical engineering from Technical University of Cluj-Napoc, and a joint PhD from University of Craiova and Politecnico di Milano, under the tutelage of prof. Petre-Marian Nicolae and prof. Flavia Grassi. Experienced researcher in topics of electric drives, power electronics, electromagnetic compatibility and power quality. He is an alumnus of Marie Skłodowska-Curie Actions (MSCA) program **ETOPIA.** He published 28 peer-reviewed papers and 1 educational book.

**Title**: Power Quality and Electromagnetic Compatibility Problems in Railway Traction Systems

**Abstract of presentation**:
Electrified railway traction systems pose significant challenges for power quality (PQ) and electromagnetic compatibility (EMC), often due to the use of power electronic converters and complex supply infrastructures. Issues such as harmonics, transients, and electromagnetic interference can impact reliability, safety, and compliance, potentially rendering costly equipment unusable. This article highlights key EMC and PQ concerns observed over five years of research, with particular focus on harmonics in the 2–150 kHz range, which are only partially addressed by current standards but have notable effects on energy transfer and equipment longevity.

Attention is given to new phenomena affecting electrical equipment like transformers, converters, and motors, discussed in the context of EN 50388. Challenges in Electric Multiple Units and specific cases involving trains manufactured by SC SOFTRONIC SA Craiova are illustrated. The text briefly presents solutions to improve PQ and EMC—including active and passive filtering, circuit design strategies, component selection, and optimized switching processes. These topics were also central to the EU-funded ETOPIA project, which supported advanced doctoral research into PQ and EMC issues at the railway network level.