# Applied Electronics 2025

**30th International Conference**

## PROGRAM

| Schedule – Overview | | |
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| **September 8, 2025** | | |
| 08:00 – 10:00 | Registration | Registration desk |
| 09:00 – 09:20 | Opening speech | Planetarium |
| 09:20 – 10:00 | Invited lecture | Planetarium |
| 10:20 – 12:00 | Section 1: Electronics in physics and space | Conference room |
| 12:00 – 13:00 | Lunch | Dining room |
| 13:00 – 14:40 | Section 2: Analogue and digital electronic systems | Conference room |
| 14:40 – 15:10 | Kick-off poster section – Pitch presentations | Conference room |
| 15:10 – 15:30 | Coffee break | Dining room |
| 15:30 – 16:50 | Poster section | Dining room |
| 15:45 – 17:45 | Free tour of Techmania Science Centre | Conference hall |
| 19:00 – 23:00 | Evening party (Best Poster Award) | Plzeňka |
| **September 9, 2025** | | |
| 08:30 | Open entrance, coffee | Dining room |
| 09:00 – 10:20 | Section 3: Embedded systems, HW and SW | Conference room |
| 10:20 – 10:40 | Coffee break | Dining room |
| 10:40 – 12:00 | Section 4: Bio-medical electronics | Conference room |
| 12:00 – 13:00 | Lunch | Dining room |
| 13:00 – 14:20 | Section 5: Electronics in industry and transport, control | Conference room |
| 14:20 – 14:40 | Coffee break | Dining room |
| 14:40 – 16:20 | Section 6: Signal processing, measurement, EMC | Conference room |
| 16:20 – 16:40 | Closing ceremony of the conference (Best Paper Award) | Conference room |

| Planetarium | September 8, 2025 |
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| 9:00 – 9:20 | **OPENING SPEECH** |
| 09:20 – 10:00 | **INVITED LECTURE**<br>**Tropic Square and TROPIC01: Addressing Security Challenges by Openness**<br><br>Bělohoubek J. |
| 10:00 – 10:10 | **FLIGHT OF FANCY – short movie** |

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## Electronics in physics and space
10:20 – 12:00                      Chairman: Claps G.

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| 10:20 | **Application of the Timepix detectors for the detection of unstable isotopes in the fission of $^{252}$Cf** <br><br> Ahmadov G., Holik M., Daniyar B., Nuruyev S., Kopatch Y., Madadzada A. |
| 10:40 | **Developing EPICS at the Frascati Beam Test Facility** <br><br> Taruggi C., Buonuomo B., Cardelli F., Di Giovenale D., Di Giulio C., Diociaiuti E., Foggetta L. |
| 11:00 | **Investigation of inorganic scintillators with MPPC arrays for alpha particle spectroscopy** <br><br> Nuruyev S., Ahmadov G., Ahmadov F., Sadygov A., Berikov D., Akbarov R., Madatzade A., Holik M. |
| 11:20 | **Patch feeder design for 3U CubeSat deployable reflectarray antenna** <br><br> Fotsing Njondung C., Vertat I. |
| 11:40 | **Side-on GEMpix detector for the measurement of charged particles from neutron induced reactions** <br><br> Claps G. |

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## Analogue and digital electronic systems
13:00 – 14:40                      Chairman: Teodorescu H.N.

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| 13:00 | **Analysis of the conjoint effects of the wiring (PCB) and of the common mode and power supply rejection in mixed mode circuits** <br><br> Tulbure S. |
| 13:20 | **Gate-Controlled 3.3V CMOS Transistor-based Constant Phase Element Design** <br><br> Semenov D., Sotner R., Jerabek J., Theumer R. |
| 13:40 | **Spectral Probability Distribution of Crosstalk in Batches of Mixed Signal Circuits and an AI Design Tool** <br><br> Teodorescu M., Teodorescu H. |
| 14:00 | **Transformerless Ultrasound Modem Frontend using Resonant Filter for Voltage Boost** <br><br> Nigg S., Peroutka Z. |
| 14:20 (ONLINE) | **A New Hybrid High-Gain Bidirectional Converter for Energy Storage Applications** <br><br> Bhajana V., Drabek P., Biswal P. |

## Poster section

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| Chung P. | **A Methodology for Remaining Driving Range Prediction Considering the Internal Thermal Spiral of Lithium-Ion Battery-Powered Electric Vehicles** |
| Lisý M. | **A Proof-Of-Concept System for Monitoring Stress in Clinical and Real-World Settings** |
| Jahanbakhshi M. | **Beamforming of a Rectangular Collinear Array Antenna for UHF Radio Communication Services** |
| Popa C. | **High-Accuracy CMOS Active Resistor Circuit** |
| Popa C. | **Improved Performance 125dB Low-Voltage Low-Power Exponential Function Synthesizer** |
| Potočný M. | **Indirect current detection method for active switch control in a low-power Flyback converter** |
| Căilean A. | **Robust Low-Beam Enabled Visible Light Communications for Vehicular Networks: Experimental Performance Evaluation Under Mobile Conditions** |
| Sýkora M. | **Test Stand for Evaluation of Directivity of the Gas Ultrasonic Transducers** |
| Růžička O. | **Timepix4: Power Supply Topology Optimization** |
| Sedláček J. | **Wideband Magnetic Field Probe with Extended Measuring Area** |

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## Embedded systems, HW and SW
09:00 – 10:20          Chairman: Poupa M.

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| 09:00 | **Enhancing Quantum-Safe Cryptography in TLS: The Role of Pre-Shared Keys**<br><br>Frauenschläger T., Füreder L., Mottok J. |
| 09:20 | **Building Modular OPC UA Testbed Components for Industrial Security Pentesting**<br><br>Heller P., Kraust S., Mottok J. |
| 09:40 | **Prototyping for High-Performance Random Number Generators for Critical Systems**<br><br>Hammer P., Mottok J. |
| 10:00 (ONLINE) | **VDK: An Open-Source Toolkit for Velostat-Based Pressure Sensor Research and Development**<br><br>Hafid A., De Looze L., Abdullah S., Difallah S., Kristoffersson A. |

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## Bio-medical electronics
10:40 – 12:00          Chairman: Hejda J.

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| 10:40 | **Cameraless respiration rate detection using an optical time of flight distance sensor**<br><br>Voigt S., Friedemann M., Glöckner A., Dienel M., Mehner J. |
| 11:00 | **Design of a Multimodal Biomechanical System for Predicting Stress Fractures in High-Risk Occupations**<br><br>Hejda J., Fischer A., Leová L., Volf P., Sokol M., Kutílek P. |
| 11:20 | **FPGA-based feedback control of an optical tweezer for biomedical measurements**<br><br>Forti R., Ciubotaru C., Cautero M., Sacco G., Cautero G., Carini A., Cojoc D. |
| 11:40 (ONLINE) | **Low-Power FPGA-Based Accelerator for Medical Image Segmentation: A Hardware-Oriented Simulation Study**<br><br>Wang Q. |

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## Electronics in industry and transport, control
**10:40 – 12:00**         Chairman: Căilean A.M.

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| 13:00 | **A Novel Approach for Improved Precision Ranging Based on Vehicle-to-Vehicle Visible Light Communications: Concept and Experimental Demonstration**<br><br>Căilean A., Beguni C., Dimian M. |
| 13:20 | **Active Capacitive Buck Boost Balancer for LiFePO Cells with Combined Analog and Digital Control**<br><br>Novák M. |
| 13:40 | **Estimation of Damping Effects in a Salient Pole Synchronous Machine Without a Damper Using SSFR Testing with a VSI**<br><br>Rozhon O., Janouš Š., Cibulka J. |
| 14:00 | **Programmable Symmetrical DC-DC Converter Using SiC Power Components**<br><br>Štarman S. |

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## Signal processing, measurement, EMC
**14:40 – 16:20**         Chairman: Kubík Z.

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| 14:40 | **A Compact UWB Antenna with Dual-Notch Band Filter for Cognitive Radio Applications**<br><br>Abdulhameed A., Al-Anbagi H., Kubík Z., Alnahwi F. |
| 15:00 | **Facial Expression Analysis from NIR Image for SAR and SBAR**<br><br>Hejda J., Kutílek P., Volf P., Sokol M., Leová L., Kalabis T. |
| 15:20 | **Low-Power Reconfigurable FIR Filter HDL Design**<br>Bagin R., Nagy L., Stopjakova V. |
| 15:40<br>(ONLINE) | **Early Warning Systems for Tsunami and Earthquake Disaster Management Using Data Science Techniques**<br><br>Hosseini S., Afza R. |
| 16:00<br>(ONLINE) | **Enhancing Network Stability: Anomaly Detection in Performance Issues within Mobile Networks**<br><br>Hosseini S., Ansari M., Chattha S. |