



**MISKOLCI**  
EGYETEM  
UNIVERSITY OF MISKOLC

University of Miskolc  
Faculty of Mechanical Engineering  
and Informatics

# Student Talent Day

## Institute of Physics and Electrical Engineering (IPEE)

Dr. László Ádám Radányi, senior lecturer



University of Miskolc, Hungary  
Faculty of Mechanical Engineering and Informatics  
2026. 04. 22.





# DEPARTMENT OF PHYSICS (DP)

## RESEARCH TOPICS – RESEARCH GROUPS

### **Building Energetics and Heat Storage Research Group**

- The group develops efficient numerical methods for solving heat conduction and diffusion-type PDEs (Partial Differential Equation).
- These methods, together with commercial software, are applied to optimization problems in building energetics and thermal energy storage, with a focus on phase change materials (PCMs).



# DEPARTMENT OF PHYSICS (DP) RESEARCH TOPICS – RESEARCH GROUPS

## **Laser Interferometric Vibration Diagnostics Research Group**

- The group focuses on advancing interferometric measurement techniques and precision diagnostics, with emphasis on the analysis of dynamic processes.
- Its primary aim is contactless and non-destructive vibration testing, enabling detailed investigation of the dynamic behavior of mechanical and engineering systems.



# DEPARTMENT OF PHYSICS (DP)

## RESEARCH TOPICS – RESEARCH GROUPS

### **Quantum Cosmology Research Group**

- The research focuses on the application of the Functional Renormalization Group (FRG) method in finite-temperature quantum cosmology.
- The group investigates quantum gravitational and cosmological phenomena using non-perturbative theoretical approaches.

### **Magnetic Hyperthermia Research Group**

- The group studies the application of magnetic nanoparticle hyperthermia for the treatment of tumorous diseases.
- Research concentrates on physical principles and biomedical applications of hyperthermia-based cancer therapies.



## **Smart Electrical Power and Facility Energy Research Group**

- The research group focuses on improving and modernizing the electrical and thermal energy efficiency of facilities through building automation.
- Its activities cover building electrical and mechanical systems, aiming to generate new knowledge and develop practically applicable, energy-efficient innovations for smart facilities.



## **Renewable Energy and Energy Storage Research Group**

- The group focuses on optimizing the integration of renewable energy sources into conventional energy systems and improving security of supply.
- Research in energy storage supports the development of innovative solutions applicable in industrial and energy system applications.



### **Electrical Industry Materials Science Research Group**

- The group studies the effects of thermal and electrical stress on materials and bonding technologies.
- Research areas include insulating materials, connectors and soldered joints, battery and semiconductor materials, as well as electrical energy storage components

### **Power Generator Development Research Group**

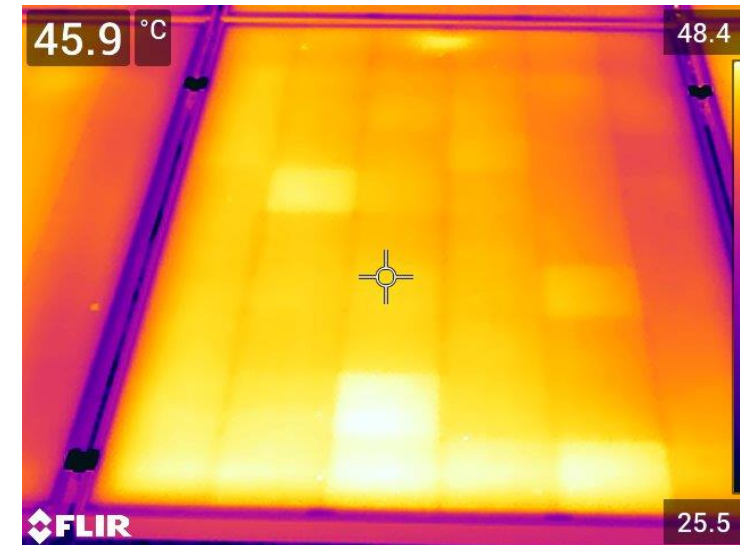
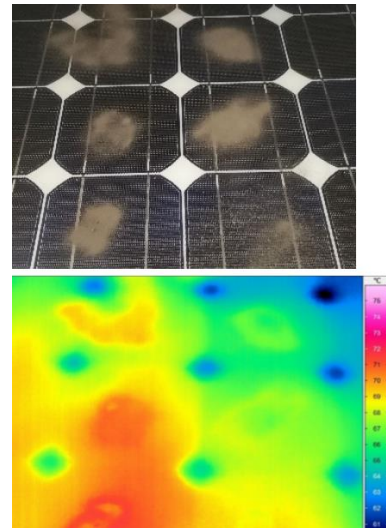
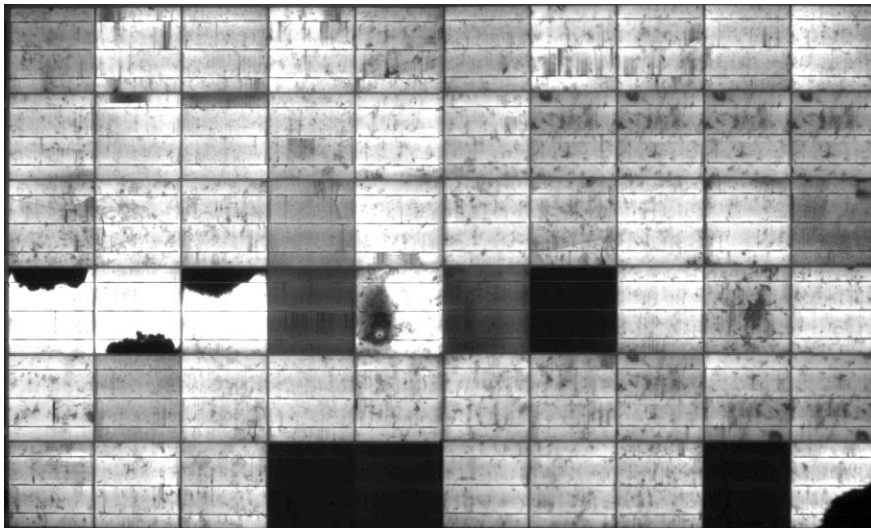
- The research group focuses on improving the stability and efficiency of power generators, with particular emphasis on synchronous machines.
- Its activities also include the development of power electronic devices and precise control solutions, such as advanced voltage regulation for reliable operation.



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For further information, please do not hesitate to contact us.  
Any Questions?





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## Thank You Very Much for Your Attention!



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