



POLISH NATIONAL AGENCY  
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| <p>name of the unit:</p> <p><b>DEPARTMENT OF SEMICONDUCTOR<br/>AND OPTOELECTRONIC DEVICES</b></p> <p>Lodz University of Technology</p>  |  | <p>symbol:</p> <p><b>K-23</b></p> <p><a href="http://dsod.eu">http://dsod.eu</a></p>   |
| <p>head of the unit:</p> <p><b>Professor<br/>Zbigniew Lisik,<br/>PhD, DSc</b></p>   | <p>potential promoters:</p> <p><b>Professor Zbigniew Lisik, PhD, DSc<br/>Maciej Sibiński, PhD, DSc<br/>Ewa Raj, PhD, DSc</b></p> | <p>contact person:</p> <p><b>Katarzyna Znajdek, PhD</b><br/>phone: 42-631-26-47<br/><a href="mailto:katarzyna.znajdek@p.lodz.pl">katarzyna.znajdek@p.lodz.pl</a></p> |
| <p>scope of activities:</p> <p>The main areas of interest and research directions within the Department's activities include the following issues falling within the general concept of the Automation, Electronic and Electrical Engineering scientific discipline:</p> <ul style="list-style-type: none"> <li>modelling and design of semiconductor devices using CAD and CAE methods for microelectronics</li> <li>design and production technologies of integrated electronics systems and semiconductor devices based on silicon and silicon carbide,</li> <li>thin and thick film technologies for microelectronics,</li> <li>high-temperature electronics and thermal issues in electronics,</li> <li>sensors and measurement systems,</li> <li>modelling, design and production of electromechanical and opto-electromechanical micro-sensors,</li> <li>automotive electronics,</li> <li>flexible electronics,</li> <li>photovoltaics, photonics and fiber optic technologies.</li> </ul> |  | <p>graphic material</p>  |
| <p>present activities:</p> <p>Current research activities conducted at the Department include the following areas:</p> <ul style="list-style-type: none"> <li>flexible thin-film solar cells - design and production of photovoltaic structures, as well as engineering and deposition technology of energy converting layers to improve the efficiency of PV devices,</li> <li>hybrid systems for solar energy conversion - innovative technologies for photovoltaic systems' cooling using micro and macro channels,</li> <li>thermal management in the design and production of electronic devices and systems,</li> <li>fiber optic technologies - implementation of functional hybrid composites, technologies for integration and production of fiber optic connections,</li> <li>technologies and design of wide bandgap semiconductor devices,</li> <li>CAD methods for designing and analyzing the structures of semiconductor devices.</li> </ul>                                       |  |  |
| <p>future activities:</p> <ul style="list-style-type: none"> <li>development of new generation photovoltaic systems as an effective source of renewable energy,</li> <li>new generations of power semiconductor devices based on Si and other materials, including GaAs, SiC and GaN,</li> <li>high-temperature electronics allowing to increase the permissible operating temperature of the devices,</li> <li>flexible electronics - production of electronic systems in the form of flexible thin layers,</li> <li>fiber optic technologies - new generations of fiber optic transmission lines and integrated photonics systems.</li> </ul>   |  |  |



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Publications/patents, awards, projects:

- M. Sibiński, A. Apostoluk, K. Znajdek, Z. Lisik, "DOWN converter of the wavelength of light, designed to increase the efficiency of solar cells", patent application no. P.419389 dated November 8, 2016, patent obtained on January 22, 2021.
- Z. Lisik, K. Znajdek, E. Raj, "Hybrid liquid solar panel with a cooling plate", patent application no. P.429308, patent no. 238548, patent obtained on September 6, 2021
- Application project POIR.04.01.04-00-0019/19: "Hybrid systems for solar energy conversion" (12/2019 - 11/2022)

Keywords:

computer modeling, high temperature electronics, electronics and microelectronics technologies, flexible electronics, automotive electronics, metrology, optoelectronics, photovoltaics.

List of internship proposal in this research team:

- cooperation in research on the production of hybrid systems for solar energy conversion,
- cooperation in the field of modeling of semiconductor devices and thermal issues in electronics,
- cooperation in research in the field of fiber optic technologies.