

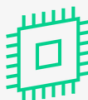
To revolutionize European industry by harnessing the power of next-generation lasers: that is the goal of LASER-PRO. More than just a project, this initiative brings together **18 world-class partners from Czechia, Lithuania, and Ukraine** to foster breakthrough innovation in sustainable manufacturing, semiconductor technology, biomedical applications, and digital laser systems.

Furthermore, LASER-PRO is empowering the next generation of innovators through talent development, collaboration, and knowledge transfer, transforming visionary ideas into real-world solutions that will **redefine Europe's high-tech industries**.

**Sustainable Manufacturing
with Advanced Laser Processing**



**Next-Generation Laser Technologies
for the Semiconductor Industry**



**Laser Applications in Biomedicine
and Biotechnology**



**Digital & 3D Printing
in Laser System Development**



BEYOND A PROJECT



Tomáš Mocek
Project Coordinator
(HiLASE Centre)

“LASER-PRO is not just another EU-funded project – it is a **strategic movement reshaping Europe's laser technology landscape**. By driving cross-border collaboration and accelerating the commercialization of laser technologies, we will establish a European Powerhouse in Laser Innovation centered around Central Bohemia and Lithuania,”

LEARN MORE AT LASERPRO-EH.EU



**18 world-class
partners**



**4 research
areas**



**3 European
countries**

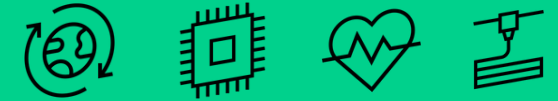


**1 Excellence
Hub**

“By harnessing our collective expertise, LASER-PRO aims to shape a sustainable and competitive future for Europe's industry. Our driving motivation is to lay a strong foundation for long-term economic prosperity by delivering tangible solutions to real-world challenges.”

LASER-PRO PARTNERS





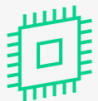
Excellent Laser Technologies for the Sustainable Prosperity of Europe



Sustainable Manufacturing with Advanced Laser Processing

Innovations for **greener**, more **efficient production lines**, supporting Europe's transition to sustainable industrial manufacturing:

- **Surface Functionalization & Texturing:** precision laser structuring techniques for advanced material properties;
- **Minimizing Material Waste & Enabling Circular Economy:** high-efficiency laser processing reducing raw material usage;
- **Multi-Beam and High-Speed Laser Processing:** enhancing laser capabilities to increase throughput and productivity;
- **Real-Time Process Monitoring & Optimization:** AI-driven laser diagnostics for real-time adjustments.



Next-Generation Laser Technologies for the Semiconductor Industry

Future-proofing Europe's semiconductor industry, ensuring a strong, resilient, and technologically **strong supply chain**:

- **Deep-Ultraviolet (DUV) Laser Technology:** high-energy DUV lasers for advanced chip manufacturing and inspection;
- **Through-Silicon Vias (TSV) and Selective Laser Processing:** laser drilling and metal deposition techniques to enhance chip interconnectivity;
- **Heterogeneous Integration & Packaging:** laser-based selective metal plating for next-generation electronic devices;
- **Laser-Assisted Semiconductor Manufacturing:** precision laser machining improving yield rates, reducing defects, and increasing energy efficiency.



Laser Applications in Biomedicine and Biotechnology

Development of safer, more effective medical treatments, transforming healthcare and biotechnology with laser-enabled solutions:

- **Microfluidic and Lab-on-a-Chip Devices:** laser micromachining creating high-precision biochips;
- **Antibacterial & Biocompatible Surfaces:** development of laser-textured implants and medical tools that reduce bacterial adhesion;
- **Laser-Assisted Cell & Tissue Engineering:** high-precision laser techniques for controlled cell growth, wound healing, and regenerative medicine;
- **Precision Laser Surgery & Therapeutic Applications:** exploration of minimally invasive laser-based treatments.



Digital & 3D Printing in Laser System Development

Smarter, more adaptable, and highly efficient laser systems for seamless adoption across high-tech industries:

- **3D-Printed Laser Components:** advanced additive manufacturing to create lighter, stronger, and thermally optimized laser systems;
- **AI & Digital Simulation for Laser Optimization:** machine learning and real-time simulations for enhanced precision, stability, and energy efficiency;
- **Topology Optimization for Lightweight Laser Designs:** innovative structural designs reducing system weight;
- **Hybrid Manufacturing for Next-Gen Lasers:** subtractive and additive laser processing for more efficient, flexible laser production.



Co-funded by
the European Union