

NANOMATCON

MULTIFUNCTIONAL NANOPARTICLES AND MATERIALS CONTROLLED BY STRUCTURE

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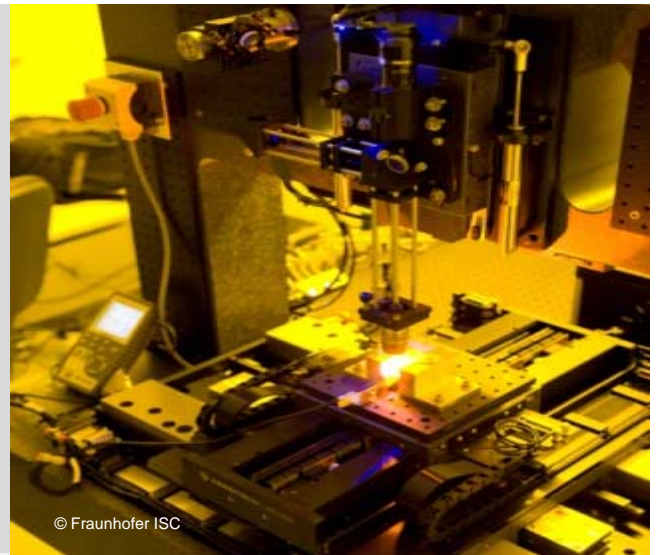
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PROJECT AIM

Multiscaled structure-tuned materials with exactly predefined hierarchical architectures composed of multifunctional nanoparticles represent a class of the most advanced future materials for applications in nano(bio)technology, nanomedicine, lighting technologies, green energy, resource efficiency as well as in security branches.

Current activities in the field of nanomaterials and engineering technologies will be expanded by integrating multiscaled 3D-laser-direct-writing machines combined with wet nanochemistry robotics in order to create the afore mentioned breakthrough materials. These activities fully correspond to the agenda defined in Horizon 2020. The project belongs to the CEP themes of composite materials (JI), biotechnology (EI), non-nuclear energy, consumption and utilization of energy (JE).

NANOMATCON envisages a creation of a new Centre of Excellence at the Technical University of Liberec (TUL) through long-term partnership between the Institute for Nanomaterials, Advanced Technologies and Innovation (Cxl) and the German Fraunhofer Institute for Silicate Research (Fraunhofer ISC) in Würzburg. The planned joint venture represented by a new Department of Functional Materials by Structure (e.g. Metamaterials) carries a powerful synergy of existing know-how in the field of chemical nanomaterials synthesis and patterning technologies.

NANOMATCON has two key topics in order to form a transnational research and development cooperation:



High level manufacturing for emerging and future nano-/bioindustries

- High-throughput/output nanomaterials development and manufacture
- Ultimate control over functional nanoparticulate coatings
- Programmed user-defined 3D-nm/ μ m/mm-architectures



Knowledge and uniqueness based highly functional nanomaterials

- Mastered multi-functionality in nanoparticulate colloids
- Photo-patternable and spinnable inks and nanocomposites



FUTURE BUSINESS TARGETS

NANOMATCON project focuses on a new generation of multifunctional nanoparticulate colloids, inks and composites containing ZnO, SiO₂, mixed oxides and bimetallic formulations with a broad scale application potential. The planned nanochemistry robotics/3D-nanoprinting tandem promises a real breakthrough in the existing nanomaterials development initiating an accelerated candidate screening and high-throughput manufacturing without traditional human and laboratory artifacts. **NANOMATCON** synergy will help to reach industrial partners at national and international level dealing with innovative nanomedical approaches, new solar antennas, photonic and opto-electronic components, smart nanotextiles as well as eco- and biosecurity related devices.

Nanoparticulate Materials

Multifunctional nanoparticles
3D-nm/μm/mm-architectures
Bioinspired structures
Sol-gel technology

Information and Communication Technologies

Micro (nano) devices for photonics/optoelectronics
Nanophosphors and wave guides

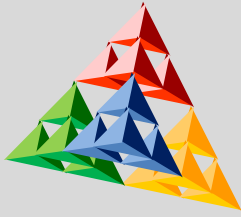
Business Opportunities

Life Sciences

Biosensing
Theranostics
Tissue and bioengineering
Eco (bio) impact studies

Energy

Solar antennas
Photo-/Electrocatalysis
Micro-/Nanophotovoltaics



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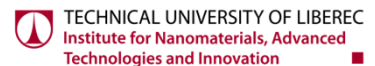
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