Welcome to the Baltic School of High Energy Physics and Accelerator Technology

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Major research activities

Field of competencies

- ✓ materials and micro - nanostructures for sensors and actuators;
- ✓ organic materials for energy and electronic applications;
- ✓ functional materials, structures and products for bio-applications;

Staff

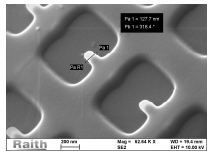
17 researchers PhD (FTE);
5 engineering staff,
6 PhD students,
4 MSc students

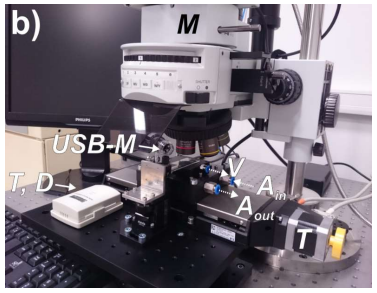
Budget

Approximately 1.5 MEUR/ year

Technological facilities

Cleanroom ISO 5, 150 m^2



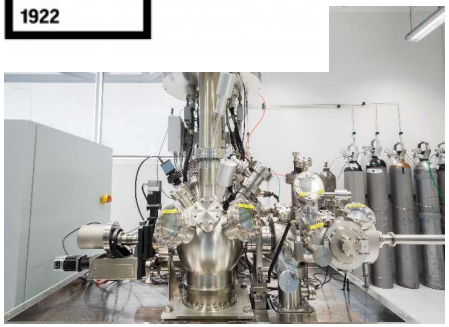


- ✓ Electron beam lithography, e-LiNE plus (Raith).
- ✓ Mask aligner with UV nanoimprint, OAI Model 204 (SPS)
- ✓ Holographic recording

- ✓ Vacuum thin film deposition units (Magnetron sputtering, E-beam evaporation, Thermal evaporation, Plasma spray deposition)
- ✓ Microwave plasma enhanced chemical vapour deposition, Cyrannus I-6 (IPLAS Innovative Plasma Systems)

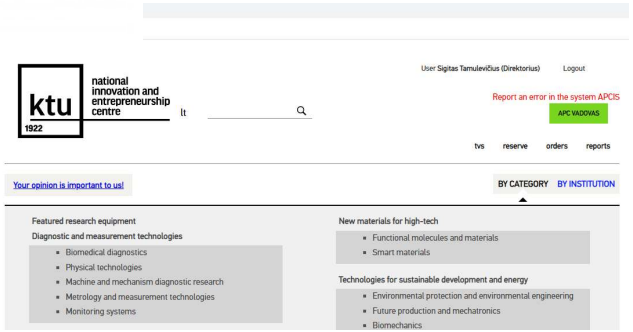
- ✓ Ion beam etching, USI-IONIC
- ✓ Deep reactive ion etching Vision LL-ICP (Plasma-Therm)
- ✓ Langmuir - Blodgett film deposition system
- ✓ Capillarity assisted nanoparticle assembly

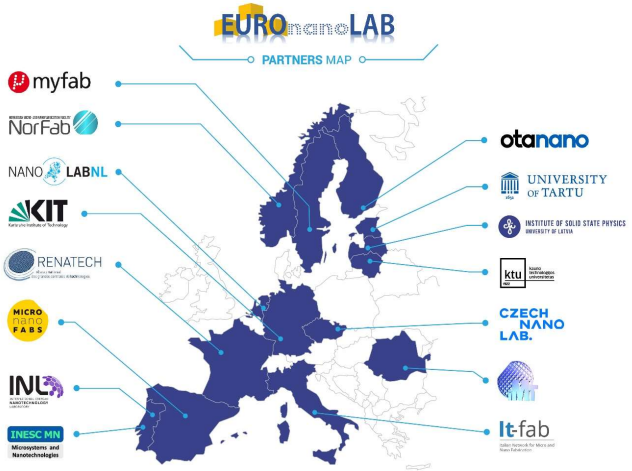
Analytical facilities

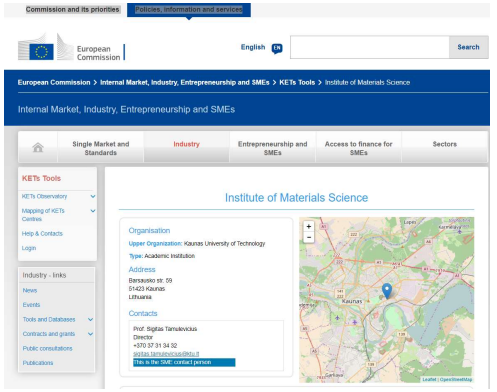


- ✓ X-ray photoelectron sp. Escalab 250 (Thermoscientific)
- ✓ Energy dispersive X-ray analysis, XFlash 4030 (Bruker)
- ✓ Infrared (FTIR) spectroscopy VERTEX 70 (Bruker)
- ✓ Ultraviolet / visible spectroscopy AvaSpec-2048
- ✓ Raman scattering spectroscopy inVia (Renishaw)
- ✓ X-ray diffraction, D8 Discover (Bruker)
- ✓ Atomic force microscopy, NanoWizard (JPK**)**
- ✓ Scanning electron microscopy, FEI Quanta 200 (FEI)
- ✓ Optical microscopy, Optika
- ✓ Spectroscopic ellipsometry (Sopra)
- ✓ Analysis of electrical characteristics of materials and devices, Keithley 6487. (Keitley)
- ✓ Scratch testing
- ✓ Roughness measurements, TR200
- ✓ Micro hardness measurements, HM 2000S.

Access to the facilities







- ✓ Kaunas University of Technology Open access centre https://apcis.ktu.edu/en/site/index
- ✓ Part of EuroNanolab (European network of 44 clean rooms) http://s6e.51c.myftpupload.com/;
- ✓ key Enabling Technologies Observatory (https://ec.europa.eu/growth/tools-databases/kets-tools/infrastructure/institute-materials-science)

European doctoral network- PCAM

- Carl von Ossietzky University of Oldenburg, Germany
- Friedrich-Schiller-Universität Jena, Germany
- Graz University of Technology, Austria
- Jagiellonian University Kraków, Poland
- Kaunas University of Technology, Lithuania
- Lomonosov Moscow State University, Russia *(suspended)*
- Sorbonne University, France
- Technishe Universität Dresden, Germany
- The Autonomous University of Madrid, Spain
- University of Luxembourg, Luxembourg
- University of Milano, Italy
- University of Milano-Bicocca, Italy
- University of Southern Denmark
- University of País Vasco, Spain

PCAM Physics and Chemistry of Advanced Materials EUROPEAN DOCTORATE

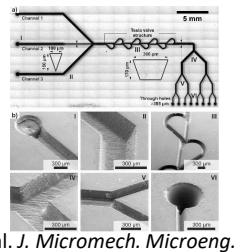
Prof. Horst-Guenter Rubahn

https://www.pcam-doctorate.eu/
14 Universities

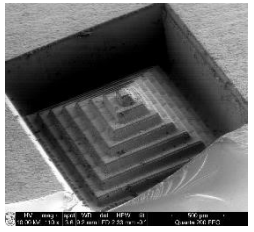
6

Materials and nanostructures for sensors, actuators, photovoltaics, and security applications

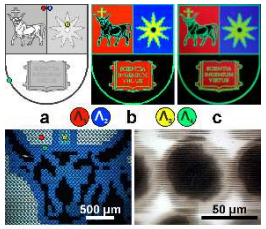
- ✓ Applications - μ-/n-Structures Imposed by a Femtosecond Laser
- ✓ AI for design of true color dot matrix hologram
- ✓ High efficiency diffraction gratings and wave beam splitters
- ✓ Materials and technologies for the high-gain Fast Timing Micro Pattern Gas detectors

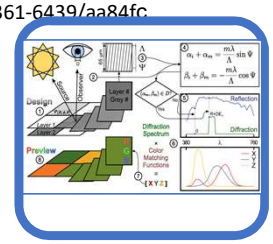


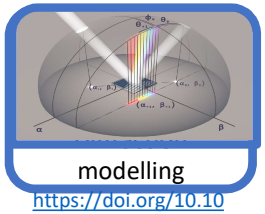
M. Juodėnas et al. *J. Micromech. Microeng.* 10.1088/1361-6439/aa84fc



T. Tamulevičius et al. *Sci. Rep.* 10.1038/s41598-018-32294-5

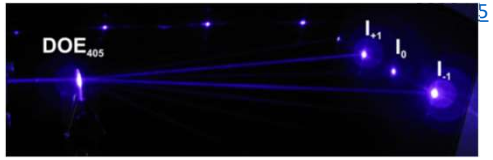




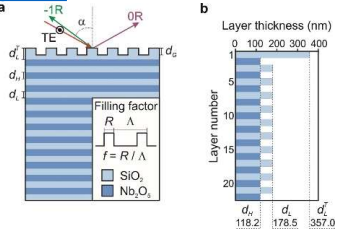


modelling

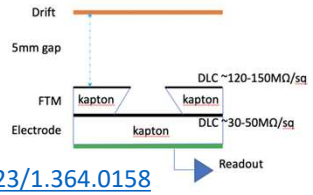
https://doi.org/10.1038/s41598-01[illegible]5

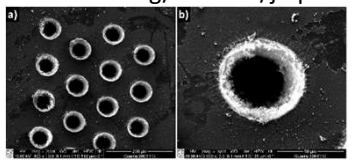


doi.org/10.1016/j.optlaseng.2013.04.001



doi.org/10.1016/j.optlastec.2020.106071

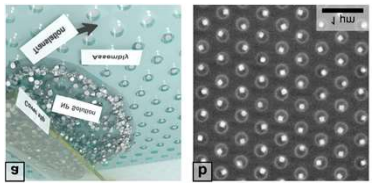




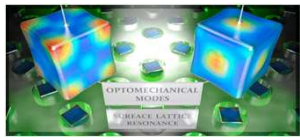
DOI: 10.22323/1.364.0158

Materials and nanostructures for sensors, actuators, photovoltaics, and security applications

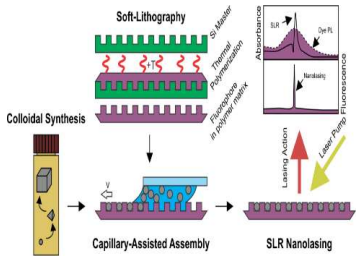
- ✓ Capillarity assisted particle assembly
- ✓ 2D regular nanostructures for lasing and sensor applications
- ✓ Plasmon relaxation in metallic nanoparticles and nanostructures

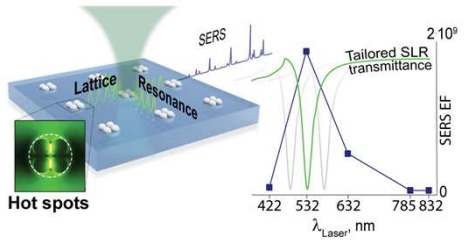


M. Juodėnas. ACS Nano doi.org/10.1021/acsnano.9b03191

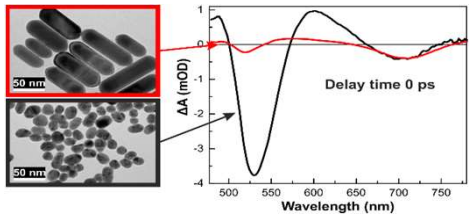


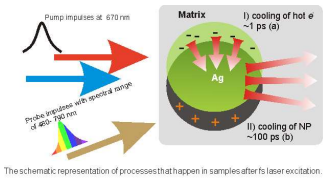
M.Juodėnas ACS Photonics doi.org/10.1021/acsphotonics.0c01187





N. Khinevich Sensors and actuators, 2023 (submitted)





D. Peckus doi.org/10.1364/OE.463961

8

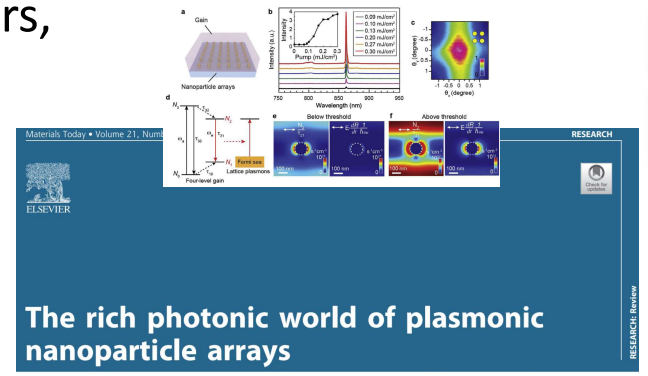
Start-up company JSC “Nanoversa”

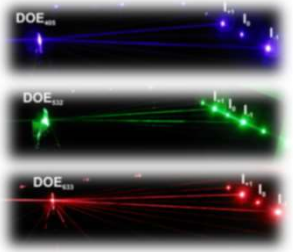
Nanoversa

- ✓ Established in 2020 by the KTU researchers.
- ✓ Aiming at commercialization of the template tailored self assembly technique for deposition of plasmonic nanoparticles.
- ✓ Anticipated products:
  - Nanoparticle deposition hardware
  - Related consumables (silicon master moulds, elastomer templates, silver colloids)
  - Applications (SERS substrates, SLR nanolasers, diffractive optics)

Solutions for Your templated nanoparticle deposition

http://nanoversa.lt
info@nanoversa.lt





Thank you for your attention!