FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

EPIC member since 2013

EPIC European Photonics Industry Consortium

FTMC – Center for Physical Sciences and Technology

Dr. Gediminas RAČIUKAITIS

Head of Department of Laser Technologies,

Center for Physical Science and Technology

Savanoriu Ave. 231, LT-02300 Vilnius, Lithuania

g.raciukaitis@ftmc.lt

FTMC - Center for Physical Sciences and Technology

FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

CENTER FOR PHYSICAL SCIENCES AND TECHNOLOGY

Department of Laser Technologies

Laboratories:

- Laser Microfabrication Technologies (2004)
- Optical Coatings (2004)
- Fibre Lasers (2006)
- Solid-State Lasers (2007)
- Plasmonics & Nanophotonics (2011)
- 3D Technologies & Robotics (2016)
- Advanced Microoptics (2020)

Activities:

Optoelectronics and laser technologies

Environmentally friendly technologies

Nuclear physics and radioecology

Organic chemistry and bio-nanotechnologies

Electrochemical materials science and technologies of functional materials

Electronics and sensors

Metrology

Fundamental research

- Established in April 2010
- Employees 700
- Research staff 330
- PhD students 114

H2020 projects

Pulsate

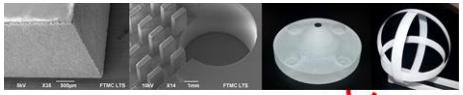
Fostering the PAN-European infrastructure for empowering SMEs digital competences in laser-based advanced and additive manufacturing

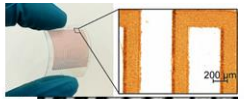
PhotonHub Europe

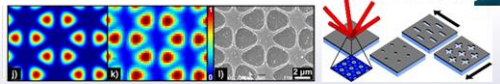
iFAST

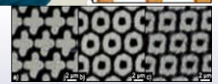
MULTI SCAN 3D

Employees	96
Dr. & hab. Dr.	31
PhD students	22
Students	20





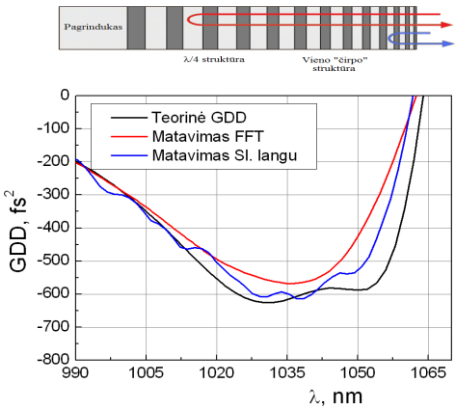




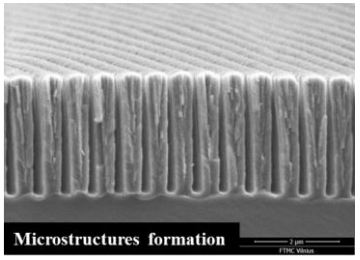
Technologies for optical coatings

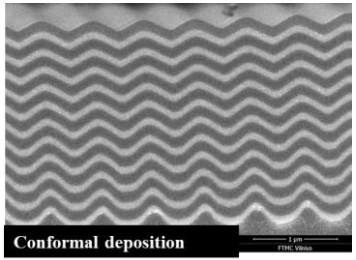
- Advanced plants for dielectric & metallic coatings
  - **Ion-beam sputtering**
  - **E-beam deposition**
  - **Magnetron sputtering**
  - **Atomic layer deposition**
- Simulation tools for multilayer dielectric coatings
  - Protective, (anti)reflective, spectrally selective, special
- Characterization of optical coatings:
  - Spectral response;
  - Surface roughness
  - Resistance to laser radiation
- Substrates
  - Glass, fused silica,
  - Non-linear crystals
  - Polymers

Chirped mirrors

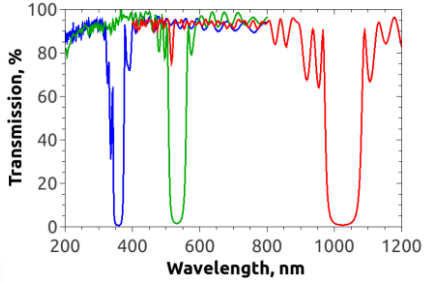


Glazing angle deposition





Optical resistivity of all-silica coatings at 355 nm wavelength in nanoseconds

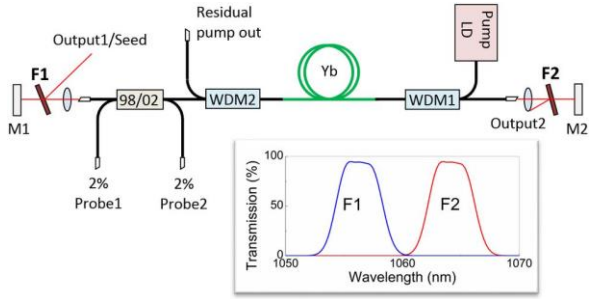


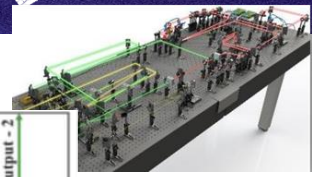
Coating	LIDT
AR	**16 J/cm²**
HR	**80 J/cm²**
WP	**24 J/cm²**

New types of fiber and solid-state lasers

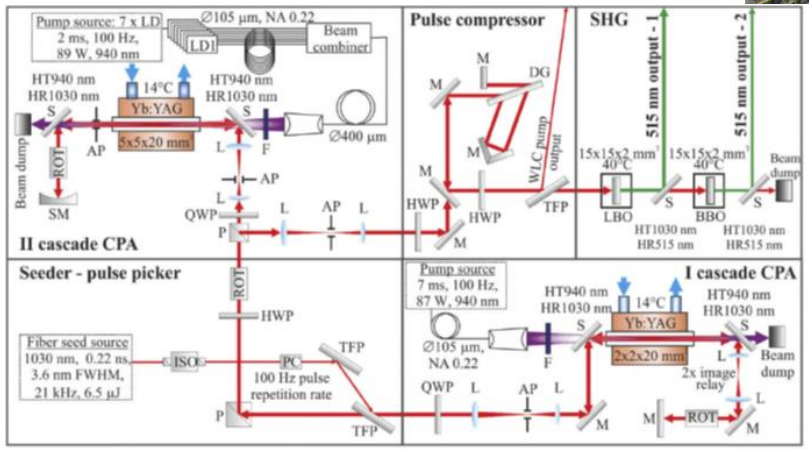
FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

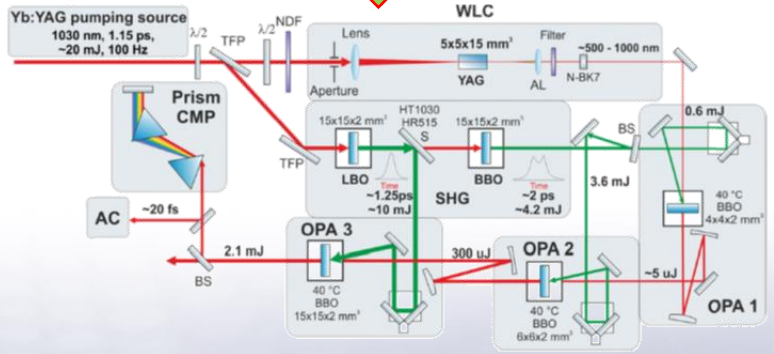
Ultra-short-pulse oscillator





Compact TW-class solid-state laser





OPCPA-laser: **10 fs, up to 10 mJ**


Letter
Vol. 40, No. 22 / November 15 2015 / Optics Letters 5255

Optics Letters

Ytterbium-doped fiber ultrashort pulse generator based on self-phase modulation and alternating spectral filtering

Kęstutis Regelskis, Julijanas Želudevičius,* Karolis Viskontas, and Gediminas Račiukaitis

WO2016020188 (A1)
EP3178137 (B1)
US10038297 (B2)
JP6276471 (B2)
CN106575849 (B)
LT6261 (B)

EKSPLA

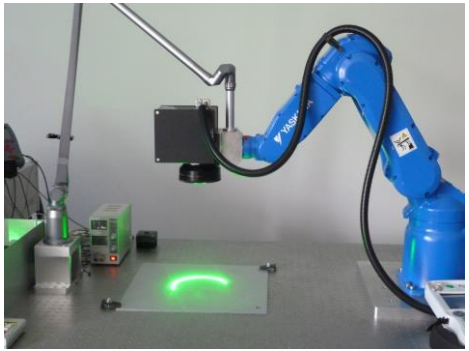
litilit

EKSPLA

Laser fabrication technologies

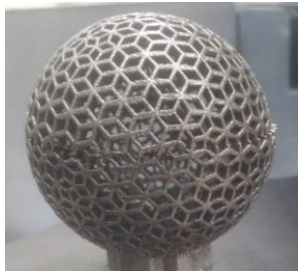
FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

Industrial laser technologies integrated with robots

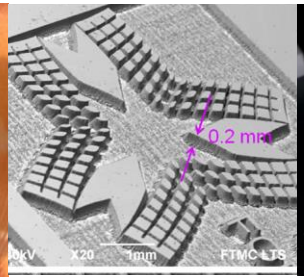


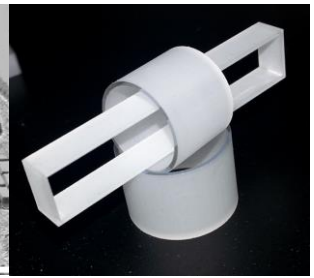
Additive manufacturing, utilizing lasers

New methods for laser-based 3D printing

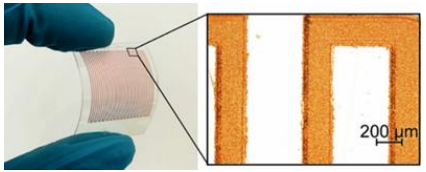


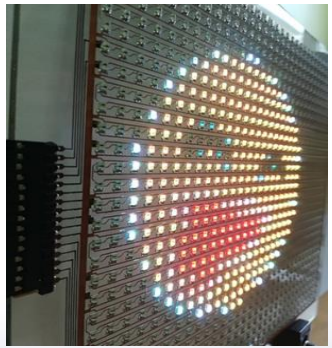
3D ablation of materials: fast and precise





SSAIL: laser initiated selective metal plating on dielectrics





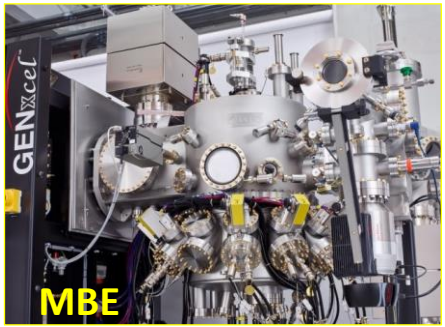
WO2018051210
JP6749482 (B2)
LT6518 (B)
US10982328 (B)
EP3512980 (A1)
CN109844178 (B)
KR102319221 (B1)

EKSPLA LIGHT CONVERSION elas LASER SOLUTIONS FOR SCIENCE & INDUSTRY

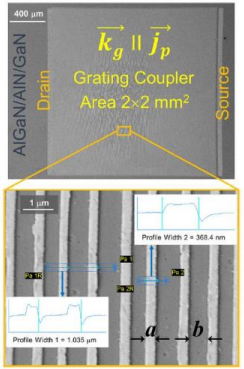
LFT LASER FABRICATION TECHNOLOGIES DMC DIRECT MACHINING CONTROL

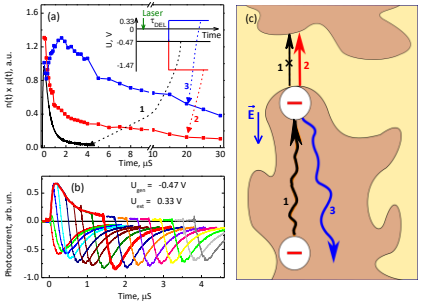
Department of Optoelectronics: Semiconductor photonics

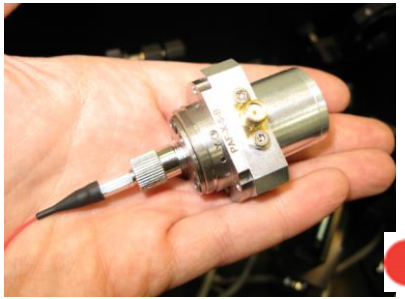
FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS



Plasmonic THz emitters





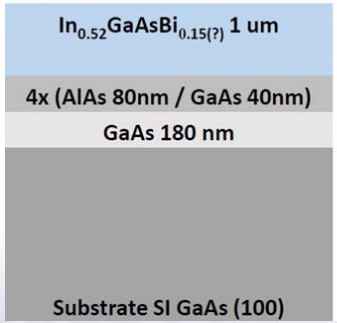


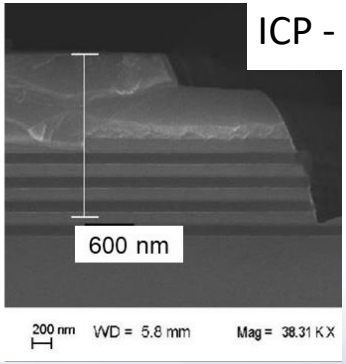
THz emitter / detector

TERAVIL

From technology – via investigations – to final products

B623





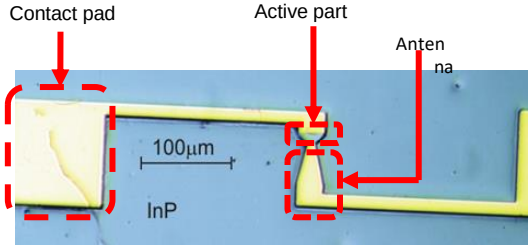
ICP - RIE etching

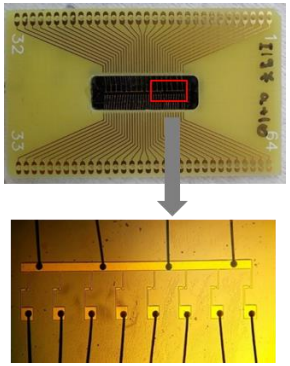
Quantum Well Edge emitting MIR laser

Department of Optoelectronics: THz sensing and imaging

FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

Antenna-coupled bow-tie arrays





MBE-grown structure: $In_{0.46}Ga_{0.54}As$, 534 nm/ InAs monolayer/InP (001) substrate, 500 µm

NEP= 230 fW/Hz @ 11 µW power

CMOS technology for THz sensing

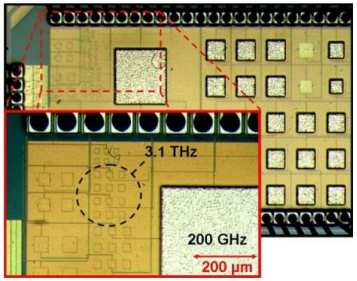
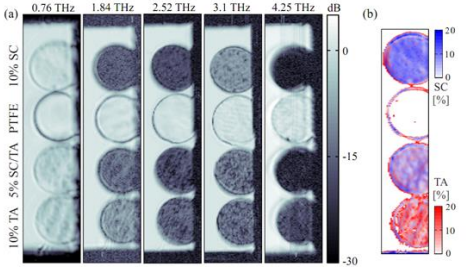
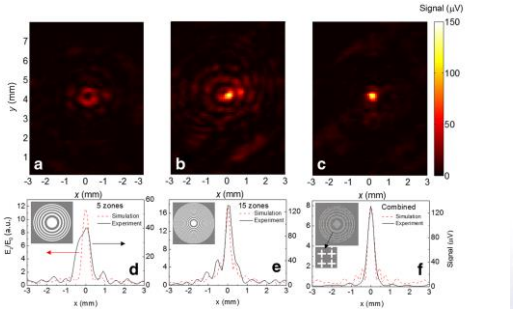
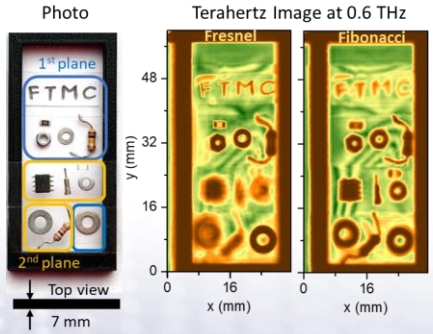


Fig. 1. Micrograph of a 1.5 x 2.5 mm² large silicon die showing different patch antennas for ten different terahertz frequencies. A close-up photograph shows the high-frequency section (for frequencies larger than 1.4 THz) of the chip, as well as a part of a 200-GHz antenna.

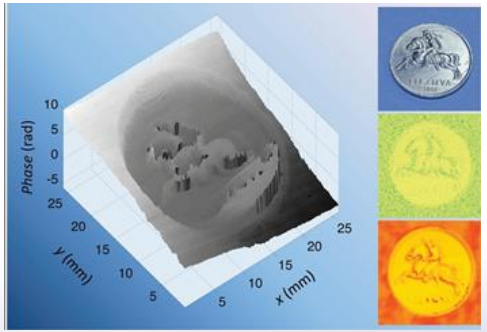


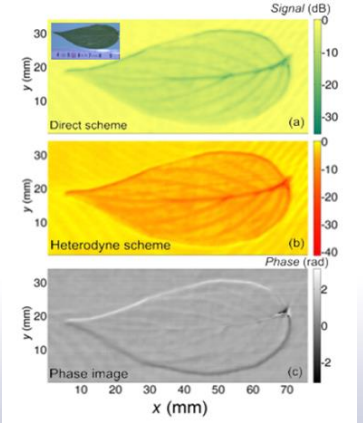
Silicon optics for THz imaging





THz heterodyne imaging at 0.6 THz





Thank you for kind attention

FIZINIŲ IR TECHNOLOGIJOS MOKSLŲ CENTRAS

appolo

FP7: 2013-2017

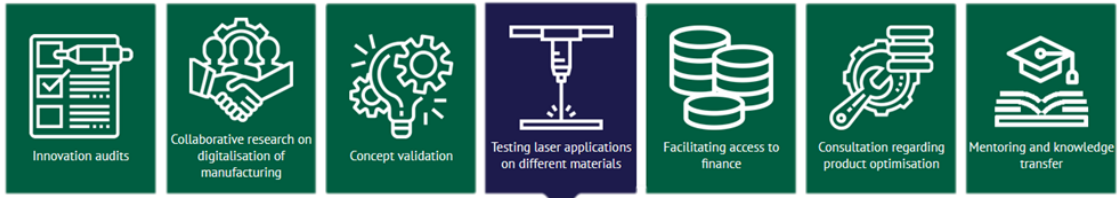
LASER LT DIH

One-stop-shop on lasers, photonics and advanced manufacturing

Pulsate

Fostering the PAN-European infrastructure for empowering SMEs digital competences in laser-based advanced and additive manufacturing

H2020: 2020-2024



PhotonHub Europe

H2020: 2021-2025