

## 2012

### **International projects**

- **“Advances in Optofluidics: Integration of Optical Control and Photonics with Microfluidics”** (2012-2016), COST MP1205 project

The project was carried out together with research institutions from Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Lithuania, Poland, Portugal, Serbia, Slovenia, Spain, Turkey and United Kingdom.

The aim of this COST Action is to establish active interlinks between laboratories working in the fields of micro and optofluidics, optical tweezers, nanoscience and photonics, bio and soft materials, focusing their work towards lab-on-a-chip systems and at promoting long-term development of these fields in Europe. The goal is to increase the knowledge in basic physics and biology from the micro- down to the nanoscale, and to develop the future generation of lab-on-a-chip devices for portable and inexpensive, but accurate and reliable equipment.

### **National projects**

- **“Creation of New Semiconductor Materials and Nanostructures for Advanced Technologies”** (2012-2015), project in the framework of the measure VP1-3.1-ŠMM-08 K of the Human Resource Development Programme of Lithuania 2007-2013 (Project No VP1-3.1-ŠMM-08-K-01-013)

The project was carried out together with Department of Physics, Department of Organic Technology and Research Centre for Microsystems and Nanotechnology of Kaunas University of Technology.

The aim of this project is to improve qualification and competences of researchers by creating materials with unique optical and electrical properties, suitable for application in semiconductor industry as well as in advanced optical and measurement devices. The main goal is to deepen knowledge of scientists and researchers of Kaunas University of Technology by carrying out research in the field of lasers, nanotechnologies and electronics, and to strengthen hi-tech sector of Lithuanian economy by spreading an experience among the students and employees of interested companies.

#### *Publications:*

- Tamulevičius, Tomas; Gražulevičiūtė, Ieva; Jurkevičiūtė, Aušrinė; Tamulevičius, Sigitas. The calculation, fabrication and verification of diffraction grating based on laser beam splitters employing a white light scatterometry technique // *Optics and lasers in engineering*. Oxford: Elsevier. ISSN 0143-8166. 2013, vol. 51, iss, p. 1185-1191. [Science Citation Index Expanded (Web of Science); Academic Search Premier; Compendex; Inspec; Science Direct]. [IF (SCIE): 1,695 (2013)]
- Jucius, Dalius; Grybas, Ignas; Grigaliūnas, Viktoras; Mikolajūnas, Marius; Lazauskas, Algirdas. UV imprint fabrication of polymeric scales for optical rotary encoders // *Optics and laser technology*. Oxford: Elsevier. ISSN 0030-3992. 2014, vol. 56, p. 107-113. [Science Citation Index Expanded (Web of Science)]. [IF (SCIE): 1,647 (2014)].
- Lazauskas, Algirdas; Guobienė, Asta; Prosyčėvas, Igoris; Baltrušaitis, Valentinas; Grigaliūnas, Viktoras; Narmontas, Pranas; Baltrušaitis, Jonas. Water droplet behavior on superhydrophobic

SiO<sub>2</sub>nanocomposite films during icing/deicing cycles // Materials Characterization. New York: Elsevier. ISSN 1044-5803. 2013, Vol. 82, p. 9-16.

- **“Technological Processes of Membranes Production for Solid Oxide Fuel Microcells” (MIKROKOKE-2)** (2012-2014), funded by Research Council of Lithuania

Deep reactive ion etching technology was arranged to make the etching experiments. Initial membrane structures in silicon were formed using inductively coupled plasma technique. Solid state reaction method was also applied for the preparation of YSZ and GDC composites with yttria and ceria. Broadband spectrometer to measure membrane structures at high temperatures (frequency range from 1 Hz to 1 GHz) and experimental stands for direct laser recording and interference laser ablation were designed. The limits of light energy range for GDC coating densification were determined.

#### *Publications:*

- Sakaliūnienė, Jolita; Abakevičienė, Brigita; Šlapikas, Kęstutis; Tamulevičius, Sigitas. Influence of magnetron sputtering deposition conditions and thermal treatment on properties of platinum thin films for positive electrode–electrolyte–negative electrode structure // Thin solid films. Lausanne: Elsevier. ISSN 0040-6090. 2015, Vol. 594, Part A, p. 101-108. [Science Citation Index Expanded (Web of Science); Science Direct]. [IF: 1,759; AIF: 3,240; IF/AIF: 0,543; Q2; 2014 Journal Citation Reports® Science Edition (Thomson Reuters, 2016)].
- Žarkov, Aleksej; Stanulis, Andrius; Sakaliūnienė, Jolita; Butkutė, Skirmantė; Abakevičienė, Brigita; Šalkus, Tomas; Tautkus, Stasys; Orliukas, Antanas Feliksas; Tamulevičius, Sigitas; Kareiva, Aivaras. On the synthesis of yttria-stabilized zirconia: a comparative study // Journal of sol-gel science and technology. New York: Springer Science+Business Media. ISSN 0928-0707. 2015, vol. 76, iss. 2, p. 309-319. [Science Citation Index Expanded (Web of Science); SpringerLINK]. [IF: 1,532; AIF: 1,793; IF/AIF: 0,854; Q2; 2014 Journal Citation Reports® Science Edition (Thomson Reuters, 2016)].
- Abakevičienė, Brigita; Žalga, Artūras; Tautkus, Stasys; Pilipavičius, Jurgis; Navickas, Edvinas; Kareiva, Aivaras; Tamulevičius, Sigitas. Synthesis of YSZ thin films by the novel aqueous sol–gel citrate-precursor method // Solid State Ionics. Amsterdam: Elsevier. ISSN 0167-2738. 2012, Vol. 225, iss. 1, p. 73-76. [Science Citation Index Expanded (Web of Science); COMPENDEX; INSPEC; Science Direct]. [IF: 2,046; AIF: 3,634; IF/AIF: 0,563; Q2; 2012 Journal Citation Reports® Science Edition (Thomson Reuters, 2016)].

#### **Self-supporting projects**

- **“Mesa-Etching, Microlithographic and Electrode Fabrication Processes for THz Emitters and Detectors: Investigation and Optimisation”** (2012-2013), funded by JSC TERAVID

The aim of the work: investigation and optimisation of the mesa-etching, microlithography and electrode fabrication processes devoted to the fabrication of the THz irradiation emitters and detectors. Subjects of the research: lift-off process, direct lithography process; process of the etching of the mesa-structures; annealing of the ohmic contacts; AuGe-Ni metallization layers.