

## Laboratory of Materials Technology Centre of New Technologies, University of Warsaw

within TEAM Project under Foundation for Polish Science  
co-financed within the framework of the Smart Growth Operational Programme  
offers:

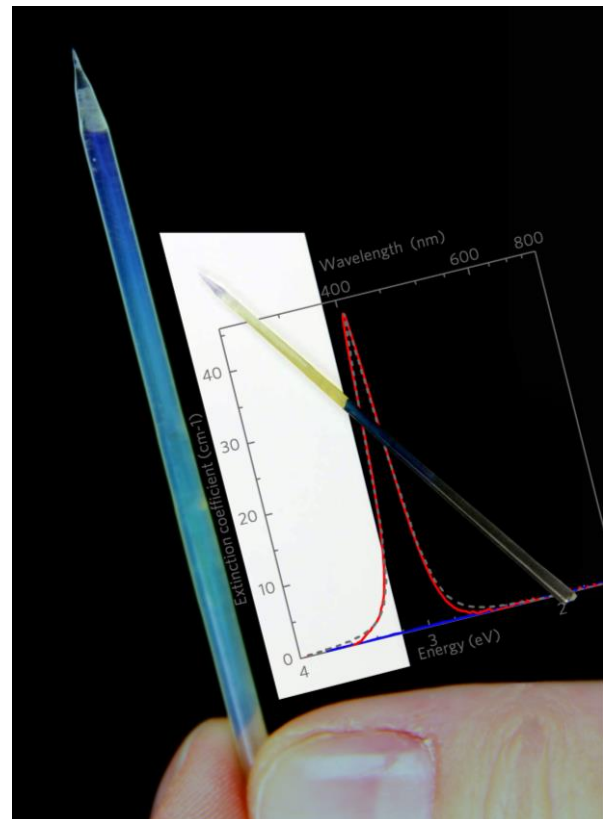
### PhD student stipends

**Project Title:** Novel photonic materials concepts, crystal growth, and beyond-the-state-of-the-art optical characterization at the crossroads

**Project Description:** Within the TEAM programme we will combine (i) **crystal growth** methods with (ii) **novel photonic materials concepts**, and with (iii) **beyond-the-state-of-the-art optical and physicochemical characterization techniques at the micron/nanoscale** available at the Centre of New Technologies, University of Warsaw. At the crossroads of these fields we will work on the development of: (i) **new technologies** for manufacturing of **novel materials** with **special electromagnetic properties** as metamaterials/plasmonic materials (new eutectic-based materials, new matrix-nanoparticles composites, materials with plasmon-exciton interaction, active microresonators with plasmon enhanced luminescence); (ii) **understanding of underlying optical/physical processes** responsible for the new observed electromagnetic phenomena; and (iii) utilization of the developed materials for various **applications** (photonics, optoelectronics, photovoltaics, and medicine). [See our previous works 1, 2, 3, 4, a movie demonstrating volumetric nanoplasmonic material made by us 5, and our facebook site 6]

**Duration:** 36 month  
(with a possible extension if the Project is considered successful by referees)

**Planned starting day:** 1.12.2017



- [1] M. Gajc et al., NanoParticle Direct Doping: Novel method for manufacturing three-dimensional bulk plasmonic nanocomposites, **Adv. Funct. Mat.** **2013**, 23, 3443.
- [2] K. Sadecka et al., When Eutectics Meet Plasmonics: Nanoplasmonic, Volumetric, Self-Organized, Silver-Based Eutectic, **Adv. Opt. Mat.** **2015**, 3, 381.
- [3] K. Korzeb, Compendium of natural hyperbolic materials, **Opt. Express** **2015**, 23, 25406.
- [4] D. A. Pawlak, How far are we from making metamaterials by self-organization? The microstructure of highly anisotropic particles with an SRR-like geometry, **Adv. Funct. Mat.** **2010**, 20, 1116.
- [5] <https://www.facebook.com/fmlaboratory/videos/608375495898423/>
- [6] <https://www.facebook.com/fmlaboratory/>

### **PhD student requirements:**

- ▶ MSc in Physics, Materials Science, Chemistry and related fields
- ▶ Very good level of English
- ▶ High average marks achieved during BSc and MSc studies
- ▶ Interest in the subject
- ▶ Engagement in work
- ▶ Team work ability
- ▶ Experience in some of the following fields will be welcomed: solid state physics, solid state chemistry, optics, photonics, materials science, photovoltaics, metamaterials/plasmonics, nanomaterials, methods of materials characterization, electromagnetism, scanning near-field optical microscopy, crystal growth, modelling of optical/electromagnetic properties of materials, quantum dots, nanoplasmonic materials.

Your research initiatives will be strongly appreciated.

**We offer:** Work in team of energetic scientists, access to modern labs and participation in novel research programme, access to new world class characterization equipment: scattering-type Scanning Near-field Microscope (s-SNOM) for nanospectroscopy and nanoimaging in near-field, Time-resolved Confocal Fluorescence Microscope for photoluminescence life-time measurements, Raman microscope for identification of Raman scattering/fluorescence at microscale with TERS/TEFS modules, WGM/SPR spectrometer for exciting of surface plasmon resonances possibility to cooperate with world class researchers.<sup>[7, 8, 9]</sup>

**Payment:** A stipend of 4000-4200 PLN/month for the PhD student will be provided.

**Application:** Interested and field related candidates with relevant expertise are welcomed to send, preferably by e-mail till 27<sup>th</sup> November, 2017: (a) an application letter, (b) Curriculum Vitae, (d) a scanned copy of University diploma including marks, (e) record of achievements (papers, presentations etc), and (f) a reference letter\* to the following e-mail address:

[dorota.anna.pawlak@cent.uw.edu.pl](mailto:dorota.anna.pawlak@cent.uw.edu.pl)

Applicants who receive a recommendation in the first stage will be invited to an interview.

\*Please put in your application a declaration of permission for personal data treatment required for recruitment procedure:

"I hereby give consent for my personal data included in my application to be processed for the purposes of the recruitment process under the Personal Data Protection Act as of 29 August 1997, consolidated text: Journal of Laws 2016, item 922 as amended."

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[7] P. Alonso-González, ..., R. Hillenbrand, **Science** **2014**, 344, 1369.

[8] A. Woessner, ..., R. Hillenbrand, **Nature Mater.** **2015**, 14, 4.

[9] V. K. Valev, J. J. Baumberg, C. Sibilica, T. Verbiest, **Adv. Mater.** **2013**, 25.