

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:

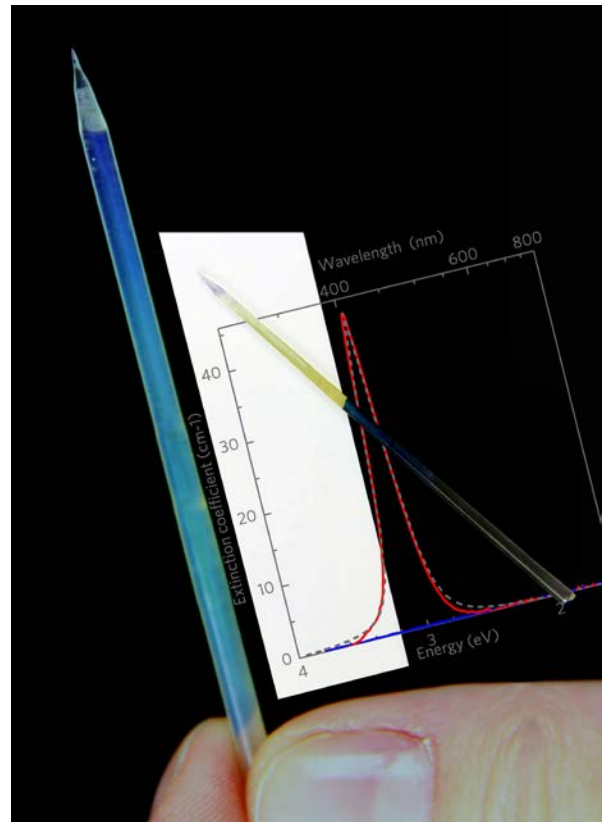
PhD student stipends

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: 01.11.2017



- [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.^[7, 8, 9]

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 13th October 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 addresses:

dorota.anna.pawlak@cent.uw.edu.pl (dorota.anna.pawlak@gmail.com)

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.

[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. Sibilia, T. Verbiest, **Adv. Mater.** **2013**, 25.