

Prospective supervisor's form

Name of the supervisor: Barbara Kościelska

Academic title: Ph.D, D.Sc., Eng.

Orcid ID number: <https://orcid.org/0000-0002-9352-9581>

Gdańsk University of Technology Faculty of Applied Physics and Mathematics

Department of Solid State Physics

Phone: +48 58 3471486

E-mail: barbara.koscielska@pg.edu.pl

Personal web page: <https://pg.edu.pl/>

Discipline: materials engineering [IMa] physical sciences [NF]

Optional

Key words (obligatory four key words describing research interests / expertise):

nanomaterials

plasmonic platforms

glass

glass-ceramics

Bibliometric indicators

1. Number of journal publications in WoS/ Scopus 60/56

2. Citations excluding self-citations WoS 239 Scopus 236

3. Hirsch index WoS 10 Scopus 9

1. The number of PhD students who have graduated under your supervision: 2

2. The number of PhD students currently supervised:

a. within the current doctoral school 1

b. within doctoral studies (previous system) 3

3. Are you currently accepting new PhD students:

a. Polish Yes/No Yes

b. Foreign Yes/No No

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Research interests or topics offered for PhD research (no more than 2000 characters)ⁱⁱ

The proposed research is related to oxide and oxy-fluoride glasses and glass-ceramics: their manufacturing and studies of the structure and selected physical properties. In glass-ceramics, the nanostructures should be dispersed in the amorphous structure, in the form of nanocrystals or in the form of metal nanoparticles. Such kind of material should be transparent in a wide range of wavelengths and should be characterized by low energy of phonons as well as chemical resistance and mechanical strength. Glasses and glass-ceramics may have very interesting physical properties, such as high optical non-linearity. In addition, plasmon resonance can be observed in glass ceramics containing metal nanoparticles, which leads to an increase in the intensity of the electromagnetic field around them. Proposed materials can be used in broadly defined optoelectronics or photonics.

The following research methods would be used in the research: XRD, SEM, TEM, DSC, XPS, UV-Vis spectroscopy and luminescence measurements.

Funding or special equipment needed to carry out a PhD project ⁱⁱⁱ:

1. Is funding available for experimental work: *Yes/No/not needed*

No

2. Is the equipment needed to complete a PhD project

available in your lab/department: *Yes/No/not needed*

Yes

Most important publicatio no more than 5 published after 1.01.2018

No	Authors/title/journal	Number of points according to the current list of the Ministry of Science and Higher Education	Publication year
1.	R. Kozioł, M. Łapiński, P. Syty, D. Koszelow, W. Sadowski, J. E. Sienkiewicz, B. Kościelska, Evolution of Ag nanostructures created from thin films: UV–vis absorption and its theoretical predictions, Beilstein J. Nanotechnol. 11 (2020) 494–507, doi:10.3762/bjnano.11.40	100	2020
2.	M. Walas, M. Lisowska, T. Lewandowski, A.I. Becerro, M. Łapiński, A. Synak, W. Sadowski, B. Kościelska, From structure to luminescence investigation of oxyfluoride transparent glasses and glass-ceramics doped with Eu ³⁺ /Dy ³⁺ ions, Journal of Alloys and Compounds 806 (2019) 1410-1418, doi: https://doi.org/10.1016/j.jallcom.2019.07.017.	100	2019

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3.	T. Lewandowski, M. Walas, A. Synak, P. Syty, J. E. Sienkiewicz, R. Kozioł, M. Łapiński, W. Sadowski, B. Kościelska, Structure, luminescent properties and FDTD simulation of TeO ₂ -BaO-Bi ₂ O ₃ -Ag: Ln ³⁺ glass-ceramics system, Journal of Luminescence 214 (2019) 116539. doi: 10.1016/j.jlumin.2019.116539	70	2019
4.	T. Lewandowski, C. Seweryński, M. Walas, M. Łapiński, A. Synak, W. Sadowski, B. Kościelska, Structural and luminescent study of TeO ₂ -BaO-Bi ₂ O ₃ -Ag glass system doped with Eu ³⁺ and Dy ³⁺ for possible color-tunable phosphor application, Opt. Mater. 79 (2018) 390-396. doi: 10.1016/j.optmat.2018.03.031	70	2018
5.	M. Walas, P. Piotrowski, T. Lewandowski, A. Synak, M. Łapiński, W. Sadowski and B. Kościelska, Tailored white light emission in Eu ³⁺ /Dy ³⁺ doped tellurite glass phosphors containing Al ³⁺ ions, Opt. Mater. 79 (2018) 280-295. doi: 10.1016/j.optmat.2018.03.015	70	2018

Most recent externally funded projects you were involved in – no more than 3

No	Project title, the name of the Principal Investigator (PI) and the institution the project was carried out	Years	Role in the project ^{iv}
1.			PI
2.			PI
3.			PI

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Additional relevant information – (no more than 1600 characters)^v



ⁱ You may select up to two disciplines out of 12 disciplines represented in the Doctoral School

ⁱⁱ Observe the limit of not more than 2000 characters

ⁱⁱⁱ Leave only one answer

^{iv} Select the role in the project: PI stands for principal investigator (refers to the holder of an independent grant and the lead researcher for the grant project), Co-I for co-investigator (Co-I assists the principal investigator in the management and leadership of the research project), R for researcher

^v Add any other relevant information e.g. awards for PhD students whom you supervised (no more than 1600 characters)