



# Karol Bartosiewicz

**Date of birth:** 23/07/1989 | **Nationality:** Polish | **Phone number:**

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**Address:** Institute of Physics of Kazimierz Wielki University, Powstancow Wielkopolskich 2 str., 85090, Bydgoszcz, Poland (Work)

**Address:** Bykowice 12, 48314, Pakosławice, Poland (Home)

## WORK EXPERIENCE

11/2019 – CURRENT Bydgoszcz, Poland

**ASSISTANT PROFESSOR** INSTITUTE OF PHYSICS, KAZIMIERZ WIELKI UNIVERSITY

- Raising grants for scientific research
- Oxide single crystal growth from the melt
- Research and development of the novel luminescence, scintillating, and photoconversion materials
- Seek strategies to enhance materials efficiency
- Development of a novel approach to growing single crystals from incongruently melting systems
- Lecturer
- Development of research procedures and laboratory equipment
- Defect engineering for tailoring material features

11/2017 – 11/2019 Sendai, Miyagi, Japan

**ASSISTANT PROFESSOR** INSTITUTE FOR MATERIALS RESEARCH, TOHOKU UNIVERSITY

- Development of the micro-pulling down method to grow single crystals from the melt
- Research and development on luminescence and scintillating materials
- Deactivation of the luminescence killers in the luminescence and scintillation processes
- Optimization of the material synthesis methods and performance
- Seek for strategies to improve energy transfer from host lattice towards activator
- Conducting measurements under synchrotron radiation excitation at UVSOR Facility Beamlines
- Combining of different experimental methods in details material characterization

09/2016 – 12/2017 Prague, Czechia

**HIGHER EDUCATION RESEARCH ASSISTANT** INSTITUTE OF PHYSICS, CZECH ACADEMY OF SCIENCE

- Research on the energy transfer processes to enhance material performance
- Research on luminescence quenching mechanisms
- Composition and defect engineering in optically active multicomponent garnet single crystals
- Measurement, characterization, and description of modern scintillation and luminescent materials
- Oxide single crystal growth from the melt using micro-pulling down method

01/2012 – 06/2013 Wrocław, Poland

**UNIVERSITY RESEARCH ASSISTANT** FACULTY OF CHEMISTRY, UNIVERSITY OF WROCŁAW

- Measurement, characterization and description of new luminescent materials
- Synthesis of new luminescent materials in the form of nanoparticles

09/2013 – 08/2016 Prague, Czechia

**UNIVERSITY RESEARCH ASSOCIATE** MARIE CURIE INITIAL TRAINING-EUROPEAN NETWORK ON LUMINESCENT MATERIALS

- Research on the energy transfer processes to enhance material performance
- Research on luminescence quenching mechanisms
- Composition and defect engineering in optically active multicomponent garnet single crystals
- Measurement, characterization, and description of modern scintillation and luminescent materials

## ● EDUCATION AND TRAINING

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10/2013 – 01/2017 Prague, Czechia

**PHD DEGREE** Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University

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Quantum Mechanics, Experimental Methods in Solid State Physics, Physics of Luminescent and Scintillation Materials, Physics of Dielectrics, Optical Properties of Solids.

**Address** Břehová 7, 11519, Prague, Czechia

10/2011 – 06/2013 Wrocław, Poland

**MASTER'S DEGREE** Faculty of Chemistry, University of Wrocław

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Physical Chemistry, Crystallography, Materials Synthesis, Physico-chemical methods of analysis, Chemistry of Lnthanide, UV-Vis Spectroscopy, Electromagnetic Radiation in Medical Diagnostics, Chemistry Laboratory Practise

**Address** F. Fryderyka Joliot-Curie 14, 50383, Wrocław, Poland

10/2008 – 07/2011 Wrocław, Poland

**BACHELOR'S DEGREE** Faculty of Chemistry, University of Wrocław

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Physical Chemistry, Organic Chemistry, Inorganic Chemistry, Physics, Quantum Mechanics, Mathematics, Analytical Chemistry, Chemical Technology, Statistics

**Address** F. Fryderyka Joliot-Curie 14, 50383, Wrocław, Poland

26/09/2023 – 22/12/2023 Sendai, Japan

**INTERNSHIP - GROWTH OF SINGLE CRYSTALS USING THE CZOCHRALSKI METHOD** Institute for Materials Research, Tohoku University

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20/08/2023 – 28/08/2023 Prague, Czechia

**INTERNSHIP - SINGLE CRYSTAL GROWTH FROM MELT** Institute of Physics, Czech Academy of Sciences

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25/08/2022 – 21/12/2022 Sendai, Japan

**INTERNSHIP - GROWTH OF SINGLE CRYSTALS USING THE CZOCHRALSKI METHOD** Institute for Materials Research, Tohoku University

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13/06/2022 – 24/06/2022 Prague, Czechia

**INTERNSHIP - SINGLE CRYSTAL GROWTH FROM THE MELT** Institute of Physics, Czech Academy of Sciences

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**Address** Cukrovarnicka 10/112, 16200, Prague, Czechia

10/06/2021 – 11/06/2021 Schenefeld, Germany

**X-RAY FREE ELECTRON LASERS WORKSHOP** The European X-Ray Free-Electron Laser Facility

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**Address** Holzkoppel 4, 22869, Schenefeld, Germany

29/01/2020 – 02/02/2020 Hamburg, Germany

**ULTRAFAST X-RAY SUMMER SCHOOL ON THE INTRODUCTION TO X-RAY SOURCES, THEORY OF X-RAY MATTER INTERACTION AND USE IN RESEARCH** The Deutsches Elektronen-Synchrotron

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**Address** Notkestraße 85, 22607, Hamburg, Germany

03/05/2015 – 05/05/2015 Verona, Italy

**SPRING WORKSHOP ON LUMINESCENT MATERIALS - EUROPEAN NETWORK ON LUMINESCENT MATERIALS (LUMINET PROJECT)** Department of Biotechnology, University of Verona

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**Address** Strada le Grazie 15, 37134, Verona, Italy

## ● LANGUAGE SKILLS

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Mother tongue(s): **POLISH**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
<b>ENGLISH</b>	C1	C1	C1	C1	C1
<b>CZECH</b>	C1	C1	C1	C1	C1
<b>JAPANESE</b>	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

## DIGITAL SKILLS

Origin Pro: proficient at scientific data processing | Basic Knowledge in MATLAB and Octave | Adobe Photoshope, Adobe Premiere

## ADDITIONAL INFORMATION

### PUBLICATIONS

#### First author or coauthor

- [1] K. Bartosiewicz, A. Szysiak, R. Tomala, P. Gołębiewski, H. Węglarz, V. Nagirnyi, M. Kirm, I. Romet, M. Buryi, V. Jary, R. Kucerkova, M. Wzorek, R. Buczyński, Phys. Rev. Appl. 20 (2023).
- [2] K. Bartosiewicz, Metals (Basel) 13 (2023) 422.
- [3] K. Bartosiewicz, V. Fritz, D. Van der Heggen, D. Szymanski, J. Zeler, J. Pejchal, A. Yamaji, R. Kucerkova, A. Beitlerova, S. Kurosawa, A. Yoshikawa, P.F. Smet, E. Zych, M. Nikl, J. Mater. Chem. C Mater. Opt. Electron. Devices 11 (2023) 8850–8865.
- [4] V. Laguta, M. Buryi, V. Babin, P. Machek, S. Zazubovich, K. Bartosiewicz, S. Kurosawa, A. Yamaji, A. Yoshikawa, K. Uličná, V. Chlan, H. Štěpánková, M. Nikl, J. Mater. Chem. C Mater. Opt. Electron. Devices 11 (2023) 1346–1359.
- [5] A. Markovskiy, V. Gorbenko, T. Zorenko, K. Bartosiewicz, A. Fedorov, Y. Zorenko, Crystals (Basel) 12 (2022) 1814.
- [6] K. Bartosiewicz, A. Markovskiy, T. Horiai, D. Szymański, S. Kurosawa, A. Yamaji, A. Yoshikawa, Y. Zorenko, J. Alloys Compd. 905 (2022) 164154.
- [7] K. Bartosiewicz, T. Horiai, A. Yamaji, A. Yoshikawa, S. Kurosawa, K.J. Kim, V. Vistovskyy, A. Voloshinovskii, Y. Zorenko, J. Lumin. 235 (2021) 118013.

### NETWORKS AND MEMBERSHIPS

- Member of domestics and international committees**
1. Member of the Kazimierz Wielki University Department of Publishing Committee
  2. Member of the Czechoslovak Crystal Growth Association (cz. Československá společnost pro růst krystalů)
  3. Implementation of procedures to compensate for curricular differences in didactic classes
  4. Member of the Direction Council: Physical basics of radiotherapy and diagnostic imaging, at the Institute of Physics of the Kazimierz Wielki University

### CONFERENCES AND SEMINARS

#### International meetings

1. Development of Materials Science in Research and Education, Pavlov, Czechia, 04-08.09.2023. Oral Presentation: "Highly nonstoichiometric  $Tb_2Y_{(0.1-1)}Al_5O_{12}:Ce$  single crystals with modified microstructure, defect concentration, luminescence, and scintillation properties".
2. 20<sup>th</sup> International Conference on Luminescence in Paris, France, 27.08-01.09.2023. Poster Presentation: "Multifunctionality of non-equiatom  $Lu_{3.09}Al_2Ga_3O_{12}:Ce$  single crystal: Toward hybrid persistent luminescence color converters".
3. 9<sup>th</sup> International Symposium on Optical Materials, Tarragona, Spain, 26-30.06.2023. Oral Presentation: "Correlation between Sc concentration and  $Lu_3(Al,Sc,Ga)_5O_{12}:Pr$  single crystal lattice distortion, atom distribution, Raman, luminescence, and scintillation properties".
4. The 12<sup>th</sup> Advanced Lasers and Photon Sources, Yokohama, Japan 17-21.04.2023. Invited speaker: "Crystal Chemistry of Garnets: Where is the Boundary between Fast Scintillators and Persistent Phosphors?"
5. 7<sup>th</sup> International Workshop on Advanced Spectroscopy and Optical Materials, Gdańsk, Poland 10-15.07.2022. Oral presentation: "Atom redistribution and defect formation in GAGG:Ce single crystals imposed by  $Mg^{2+}$  and  $Li^+$  codoping: the impact on the luminescence and scintillation properties"
6. 14<sup>th</sup> Europhysical Conference on Defects in Insulating Materials, Ghent, Belgium 03-08.-7.2022. Invited speaker: "A study of isovalent and aliovalent codoping effects on atoms segregation, defect creation, luminescence and scintillation properties in aluminum single crystals"

### PROJECTS

26/09/2023 – 26/11/2023

**Multifunctionality of non-stoichiometric  $(Y,La,Lu)_{3\pm x}(Al,Ga)_{5\pm x}O_{12}:Ce$  ( $x \neq 0$ ) single crystals: towards hybrid afterglow LED color converters for energy efficiency** Single Crystal Growth; Garnet Phase Crystals; Crystal Growth

from Melts; Micro-Pulling Down Method; Czochralski Method; Single-Luminescence; Scintillator Materials; White Light Emitting Diodes (w-LED); Persistent Luminescence; Afterglow; Nonstoichiometric Compounds.

23/06/2021 – 22/06/2024

**Crystal-phase engineering of complex rare earth doped  $\text{Ln}^{3+}\text{-M}^{3+}\text{-O}_2$  ( $\text{Ln}=\text{Lu, Y, Gd, Tb}$ ;  $\text{M}=\text{Al, Ga, Sc}$ ) oxide systems in the modeling of luminescence, scintillation, and photo-convention properties** Single crystal, Perovskite and Garnet phases, Eutectic composite system, Phase transition, Crystal growth from the melt, Micro-pulling down method, Czochralski method, Single-crystalline film, Liquid phase epitaxy method, Luminescence, Scintillator, Photo-conversion, White light-emitting diode

09/10/2018 – 08/10/2019

**Scintillators based on  $\text{Ce}^{3+}$  doped  $\text{Lu}_3\text{-xLaxAl}_5\text{-yGaxO}_{12}$  mixed garnets: crystallization, luminescent and scintillation properties** Single crystal, Garnet phases, Crystal growth from the melt, Micro-pulling down method, Single-crystalline film, Liquid phase epitaxy method, Luminescence, Scintillator

## HONOURS AND AWARDS

16/03/2023

**Rector's Award for Organizational Achievements in the academic year 2022-2023 at Kazimierz Wielki University, – Kazimierz Wielki University** Write here the description...

01/02/2022

**The best young scientist at Kazimierz Wielki University – Kazimierz Wielki University**

## MANAGEMENT AND LEADERSHIP SKILLS

**Organisational / managerial skills** Member of Tohoku University Foreign Students Association in Sendai, Japan Organizer, Leader and Vice Leader of Interactive corner and Stage teams, respectively, at Tohoku University International Festival

Leader of the hiking club in Sendai, Japan

Leadership (I regularly act as a camplleader at the international workcamps); Sense of organisation; Independence

**Conference and summer school secretary** Conference and summer school secretary of 11th International Conference on Luminescent Detectors and Transformers of Ionizing Radiation 11-17 September 2021, Bydgoszcz, Poland

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