

# ALEKSANDER BOGUCKI

## CONTACT INFORMATION

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FULL NAME: Aleksander Mateusz Bogucki  
ORCID ID: [0000-0001-7698-9984](https://orcid.org/0000-0001-7698-9984)

## EDUCATION

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| 10/2014 – 12/2023 | University of Warsaw - Full-time PhD Studies, Field: Physics, Specialization: Condensed Matter Physics and Semiconductor Nanostructures; PhD thesis supervised by Prof. Dr. hab. Piotr Kossacki entitled: <b>"The Influence of Strain on Magnetic Ion Relaxation Time in Semiconductor Nanostructures"</b> |
| 10/2012 – 09/2014 | University of Warsaw - Full-time Master's Studies, Field: Physics, Specialization: Condensed Matter Physics and Semiconductor Nanostructures; Master's thesis supervised by Prof. Dr. hab. Piotr Kossacki entitled: <b>"Investigation of the Anisotropy of the Hole g-factor in Quantum Dots"</b>          |
| 10/2009 – 09/2012 | University of Warsaw - Full-time Bachelor's Studies, Field: Physics. Bachelor's thesis supervised by Prof. Dr. hab. Piotr Kossacki entitled: <b>"Investigating the Influence of Microwave Radiation on the Photoluminescence of Quantum Wells (Cd, Mn)Te/(Zn, Mg)Te"</b>                                   |

## RESEARCH GRANTS AS PI

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| 06/02/2017 – 05/02/2020 | NATIONAL SCIENCE CENTRE<br>Preludium 11<br><b>Micro Lenses Manufactured by 3D Two-Photon Lithography as a Tool for Studying the Spectroscopy of Selected Individual Quantum Dots</b> |
| 16/07/2013 – 15/07/2017 | MINISTRY OF SCIENCE AND HIGHER EDUCATION<br>Diamond Grant<br><b>Studies of the Spin Dynamics of a Single Cobalt Ion in a Quantum Dot Using Optical Methods</b>                       |

## AWARDS

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09/08/2015	OSA, THE OPTICS OUTREACH GAMES Second place for the Polish team consisting of: Aleksander Bogucki, Małgorzata Piłat, Justyna Piwowar, Łukasz Zinkiewicz San Diego, USA
18/09/2015	BEST STUDENT TALK Second place in the competition for the best student oral presentation at the 17th International Conference on II-VI Compounds and Related Materials Paris, France
12/04/2014	BEST STUDENT POSTER Second place in the competition for the best poster at the 10th International Young Scientist Conference "Developments in Optics and Communications" Riga, Latvia
2013/2014	MINISTER OF SCIENCE AND HIGHER EDUCATION SCHOLARSHIP

## INTERSHIPS

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03/2018	LABORATOIRE NATIONAL DES CHAMPS MAGNÉTIQUES INTENSES Research focused on Raman scattering in layered materials $MnPS_3$ , $CrBr_3$ . Grenoble, France
10/2014	LABORATOIRE NATIONAL DES CHAMPS MAGNÉTIQUES INTENSES Research focused on CdSe quantum dots without magnetic ions and with $Fe^{2+}$ and $Mn^{2+}$ ions in high magnetic fields. Grenoble, France
22/07/2013–02/08/2013	ERASMUS INTENSIVE PROGRAM "SPIN-ELECTRONICS & APPLICATIONS" School focused on spin physics in semiconductor nanostructures. Chania, Greece
09/04/2014–12/04/2014	LASERLAB III Training School for Potential Users "Laser Applications in Spectroscopy, Industry and Medicine" Riga, Latvia
07/2012	LABORATOIRE NATIONAL DES CHAMPS MAGNÉTIQUES INTENSES Research focused on optically detected paramagnetic resonance (ODMR) in manganese magnetic ions. Grenoble, France

## SELECTED PUBLICATIONS <sup>1</sup>

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1. A. Łopion, **A. Bogucki**, W. Kraśnicki, K. E. Połczyńska, W. Pacuski, T. Kazimierzczuk, A. Golnik, and P. Kossacki, *Magnetic Ion Relaxation Time Distribution within a Quantum Well*, Phys. Rev. B **106**, 165309 (2022).
2. **A. Bogucki**, M. Goryca, A. Łopion, W. Pacuski, K. E. Połczyńska, J. Z. Domagała, M. Tokarczyk, T. Faş, A. Golnik, and P. Kossacki, *Angle-Resolved Optically Detected Magnetic Resonance as a Tool for Strain Determination in Nanostructures*, Phys. Rev. B **105**, 075412 (2022).
3. D. Vaclavkova, A. Delhomme, C. Faugeras, M. Potemski, **A. Bogucki**, J. Suffczyński, P. Kossacki, A. R. Wildes, B. Grémaud, and A. Saúl, *Magnetoelastic Interaction in the Two-Dimensional Magnetic Material  $MnPS_3$  Studied by First Principles Calculations and Raman Experiments*, 2D Materials **7**, 035030 (2020).
4. A. Łopion, **A. Bogucki**, K. E. Połczyńska, W. Pacuski, A. Golnik, T. Kazimierzczuk, and P. Kossacki, *Charged Exciton*

<sup>1</sup>Full list of publications and conference presentations is attached in a separate file.

*Dissociation Energy in (Cd,Mn)Te Quantum Wells with Variable Disorder and Carrier Density*, Journal of Electronic Materials (2020).

5. **A. Bogucki**, Ł. Zinkiewicz, M. Grzeszczyk, W. Pacuski, K. Nogajewski, T. Kazimierzczuk, A. Rodek, J. Suffczyński, K. Watanabe, T. Taniguchi, P. Wasylczyk, M. Potemski, and P. Kossacki, *Ultra-Long-Working-Distance Spectroscopy of Single Nanostructures with Aspherical Solid Immersion Microlenses*, Light: Science & Applications 9, (2020).
6. T. Kazimierzczuk, **A. Bogucki**, T. Smoleński, M. Goryca, C. Faugeras, P. Machnikowski, M. Potemski, and P. Kossacki, *Time-Resolved Magneto-Raman Study of Carrier Dynamics in Low Landau Levels of Graphene*, Physical Review B 100, (2019).
7. J. Kobak, **A. Bogucki**, T. Smoleński, M. Papaj, M. Koperski, M. Potemski, P. Kossacki, A. Golnik, and W. Pacuski, *Direct Determination of the Zero-Field Splitting for a Single Co<sup>2+</sup> Ion Embedded in a CdTe/ZnTe Quantum Dot*, Phys. Rev. B 97, 045305 (2018).
8. **A. Bogucki**, Ł. Zinkiewicz, W. Pacuski, P. Wasylczyk, and P. Kossacki, *Optical Fiber Micro-Connector with Nanometer Positioning Precision for Rapid Prototyping of Photonic Devices*, Optics Express 26, 11513 (2018).
9. **A. Bogucki**, T. Smoleński, M. Goryca, T. Kazimierzczuk, J. Kobak, W. Pacuski, P. Wojnar, and P. Kossacki, *Anisotropy of In-Plane Hole g Factor in CdTe/ZnTe Quantum Dots*, Phys. Rev. B 93, 235410 (2016).
10. J. Kobak, T. Smoleński, M. Goryca, M. Papaj, K. Gietka, **A. Bogucki**, M. Koperski, J.-G. Rousset, J. Suffczyński, E. Janik, M. Nawrocki, A. Golnik, P. Kossacki, and W. Pacuski, *Designing Quantum Dots for Solotronics*, Nature Communications 5, (2014).

## PATENT APPLICATIONS

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1. **A. Bogucki**, P. Nurowski, A. Włodarczyk and L. Moździerz *Method of tuning chordophones in alternative musical scales with a reduced number of steps compared to the original tuning based on monotonous surjective mappings.*, patent pending
2. M. Goryca and **A. Bogucki**, *Sample Holder for Measurements of Optically Detected Magnetic Resonance*, Patent, PL239882B1 (24 January 2022).
3. M. Goryca and **A. Bogucki**, *Sample Holder for Measurements of Optically Detected Magnetic Resonance*, Patent application, WO2021064687A1 (8 April 2021).

## SKILLS

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<b>Programming:</b>	<b>Python</b>
<b>Data Analysis:</b>	Python, OriginLab
<b>Main Techniques:</b>	Photoluminescence, Microphotoluminescence, Reflection, Time-Resolved Spectroscopy, Optical Pump-Probe Spectroscopy, Scanning Electron Microscopy, Magneto-spectroscopy, Raman Scattering Spectroscopy
<b>Nanofabrication:</b>	Two-photon polymerization 3D direct laser writing (Nanoscribe), basic fabrication of TMDC layered materials

## INTERESTS

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<b>Science Outreach</b>	● Project with jazz pianist Leszek Moździerz on designing 10TET (Tone Equal Temperament) acoustic grand piano ● Lectures on the physics of music ● Lecturing in Sailing Physics, Sailing Theory, and Meteorology (Junior Sailing Instructor Patent - nr: 3440) ● Member and active participant in Student Nanophysics Chapter, Optical and Photonics Chapter, SPIE Chapter, and Nanotube Chapter at University of Warsaw. Organized and promoted various science events and lectures. ● Led multiple student projects, including studies on rheological properties of Lamian noodles and building Earth's magnetic field NMR.
<b>Music</b>	Piano (6 years of first level music conservatory in Poland, main instrument piano), Singing (Faculty of Physics, University of Warsaw choir member since 2013)
<b>Sport</b>	● Sailing (Yacht Helmsman Patent - No.: W/258, Senior Motorboat Helmsman Patent - No.: 024016), ● Running (Completed marathons in 2022 - time 3:39:58, and 2023 - time 3:37:02)
<b>Graphics</b>	3D graphics (Blender 3D), SEM images coloring (Gimp), hand sketches vectorized (Inkscape)
<b>Cooking</b>	Exploring cooking from science point of view: homemade sourdough bread, kimchi, seitan, etc.

## TEACHING

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2016/2017	FUNDAMENTALS OF PHYSICS II INDIVIDUAL STUDIES Demonstrations for lectures 60 hours
2015/2016	FUNDAMENTALS OF PHYSICS II INDIVIDUAL STUDIES Demonstrations for lectures 60 hours
2014/2015	FUNDAMENTALS OF PHYSICS I INDIVIDUAL STUDIES Demonstrations for lectures 60 hours INDIVIDUAL PRE-LABORATORY WORKSHOP B 45 hours INDIVIDUAL PRE-LABORATORY WORKSHOP C 30 hours
2013/2014	FUNDAMENTALS OF PHYSICS I INDIVIDUAL STUDIES Demonstrations for lectures 60 hours INDIVIDUAL PRE-LABORATORY WORKSHOP B 45 hours INDIVIDUAL PRE-LABORATORY WORKSHOP C 30 hours
2012/2013	FUNDAMENTALS OF PHYSICS II INDIVIDUAL STUDIES Demonstrations for lectures 60 hours

## PROFESSIONAL EXPERIENCE

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Since 11/2022	DATA SCIENTIST, DATA ANALYST SOLVEMED INC., 16192 Coastal Highway, Lewes, DE 19958, USA Solvemed is a company that specializes in AI for critical care in neurology. They use machine learning to make digital tools for checking pupil size and eye movements.
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